

DPX200-P1 伺服驱动说明书

DPX200-P1

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series

AC Servo Driver User Manual

【Please read this manual carefully before use to avoid
damage to the drive】

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foreword

Thanks for choosing DPX200-P1 series AC servo driver.

This manual describes the installation, commissioning, maintenance and operation of DPX200-P1 AC servo drive (100W~11KW range). Before use, please read this manual carefully to familiarize yourself with the safety precautions of this product.

Due to product improvement, specification, version change and other reasons, this manual will be changed in due course, and the company will not notify you in advance.

If you have any questions when using the company's products, please refer to the relevant instructions or call the technical service department of the company.

We will solve your problem in the shortest time.

Symbols and warning signs:



Danger: Indicates that the operation error

may endanger personal safety!



Note: Indicates

that the wrong operation may cause damage to the equipment!

Safety

Precautions

Unpacking

Inspection



Do not install missing parts and damaged controllers;



The servo drive must be used in conjunction with the matching servo motor.

Install



Installed on a non-combustible metal frame to prevent dust, corrosive gases, conductive objects, liquids and flammables from entering, and

Maintain good cooling conditions;



When installing, be sure to tighten the installation screws of the driver. The servo driver and servo motor should avoid vibration and prohibit shock.

wiring



Please have professional electrical engineering personnel do the wiring work;




Before wiring, please confirm that the input power is cut off. Wiring and inspection must be done after the power is cut off and the driver indicator light is off.

Proceed after extinguishing to prevent electric shock;





When plugging and unplugging the wiring terminals of the driver, please


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make sure that the indicator light of the driver is off before proceeding;  The ground terminal PE must be reliably grounded through the screw on the left side of the driver;


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 Please set up an emergency stop circuit outside the controller;


 Do not connect the power input wire to the

output U, V, W terminals;  Please tighten the output terminals with proper torque.


power ups


 Please confirm whether the input power of the main circuit is


consistent with the rated working voltage of the driver;  Do not conduct high voltage resistance and insulation performance tests on the driver at will;


 Do not connect the electromagnetic contactor and electromagnetic switch to the output circuit.

run


 After the driver is powered on, please do not touch the output terminals directly;

 After the system is running, the driver and motor may have a

high temperature rise, please do not touch them at will;  Please confirm the input and output signals to ensure safe operation;


 After confirming that the running signal is cut off, the alarm can be reset. Carrying out an alarm reset in the running signal state will cause the drive to


sudden restart


 Do not change the parameter setting of the driver at will, and the parameter modification should be carried out under the standby condition.


Maintenance and Inspection


 Do not touch the controller terminals directly, some

terminals have high voltage, which is very dangerous;  Before turning on the power, be sure to install the outer cover; when

removing the outer cover, be sure to cut off the power first;  Before wiring, please confirm whether the input power is off;

 Cut off the input power of the main circuit, and confirm that the indicator light of the

driver has been completely extinguished before inspection and maintenance;  Please designate professional electrical engineering personnel to carry out inspection and maintenance work;

 When the power is on, please do not carry out wiring, disassembly and installation of terminals and other operations.

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There are integrated circuits on the main control board of the drive, please pay full attention when checking to avoid damage caused by electrostatic induction.

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Chapter One

overview

1.1 product introduction

DPX200-F1 The series can be matched with various open-loop, semi-closed-loop and closed-loop systems. It is a cost-effective product specially developed by the company for applications such as position, speed, and torque-limited position control, which meets the requirements of most industries. Adopt international advanced motor control dedicatedDSP processor andIPM Intelligent power module, high integration, small size, perfect protection, good reliability. Use the bestPID Algorithm completePWMControl and performance have reached the advanced level of similar products.

1.2 DPX200-P1 Servo drive unit performance index

S p e c i f i c a t i o n	control method		Single phase: 110V Three phase: 220V full wave rectification
			IPM SVPWM control Sine wave current drive method
	encoder feedback		Ordinary incremental type: 2500 lines
	Con ditio ns of Use	Use/storage temperature	0~+40℃/-20~65℃ (if the ambient temperature is above 40℃, please forced ambient air circulation)
		Use/storage humidity	Below 90%RH (no condensation)
		Vibration/shock resistance	4.9m/s ² / 19.6/s ²
		degree of protection	IP10
		pollution level	level 2
		sea height	Lower than 1000m (higher than 1000m, please use with derating)
sp e c i f i c a t i o n	perfor manc e	load change rate	0~100% load: less than ±0.01% (at rated speed)
		rate of change of speed	0~100% load: ±0.01%
		Voltage change rate	Rated voltage ±10% (at rated speed)

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ro l m o d e	enter		Current overload capability	150% (rated current for 1 minute), 200% (rated current for 5 seconds)
			Temperature change rate	25±25°C: less than ±0.1% (at rated speed)
			Speed control range	1:5000

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	Signal		frequency characteristic		<=800Hz
			Torque Control Accuracy		±1%
			speed response	no load	10ms (from zero speed to rated speed)
				rated load	100ms (from zero speed to rated speed)
			Soft start time setting		0~10s (acceleration and deceleration can be set separately)
	input signal	Speed command input	command voltage		DC±10V/rated speed (factory default setting, can be set by parameter set up) Input voltage: maximum ±12V (the motor rotates forward when the command is positive)
			input resistance		about 14KΩ
			Circuit Time Parameters		About 4.7us
position control mode	performance		command smoothing		Low-pass/S-curve smoothing filter
			feedforward compensation		0~100%
			positioning complete width		0~65535 command unit (setting resolution is 1 pulse)
	Position command input	command pulse	Input Pulse Shape		Pulse+direction; CCW/CW; A/B phase pulse
			input form		differential drive
					open collector
			Input pulse frequency		Differential drive: 500Khz
			command smoothing		Low-pass filtering/FIR filtering
			Built-in open collector pull-up resistor		Built-in two pull-up to external +24V 2KΩ resistors
I/O signal	Digital input signal	number of signals		9 DI inputs	
		functional planning		I/O input function planning is possible	
		signal function		Servo enable, abnormal alarm clear, speed inversion, pulse clear wait	

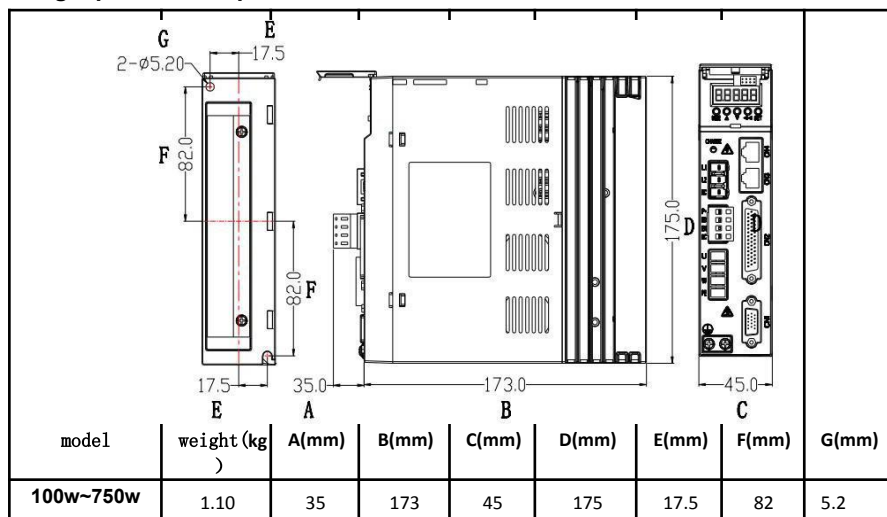
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	digital output Signal	Signal content	Brake signal output, servo alarm signal output, torque arrival signal output, Z pulse collector output, positioning completion signal output, Ready signal output, speed arrival signal output
	Encoder feedback signal	Feedback pulse shape	differential output
		Feedback pulse mode	A/B phase quadrature coded signal
		Number of feedback pulses	2500 lines
built-in function	Multiple mechanical origin return functions		Various methods of mechanical return to origin
	Electronic gear ratio		$1/1000 \leq N/M \leq 1000$
	regenerative braking	braking method	energy braking
		Braking resistor	built-in or external
	Protective function		Position tolerance, overspeed, main circuit overvoltage/undervoltage, power module failure, brake circuit abnormality, overcurrent, overload, encoder signal interference, encoder disconnection, abnormal control power supply, etc.
	monitoring function		Motor speed, current position pulse number, position command pulse number, Position deviation, motor torque, motor current, running status, I/O signal, analog command/torque voltage, servo alarm memory, etc.
	communication function		RS485 (standard ModBus protocol)
	display, operation		5-digit LED digital tube; 5 keys

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1.3 DPX200-P1 Servo drive unit installation size

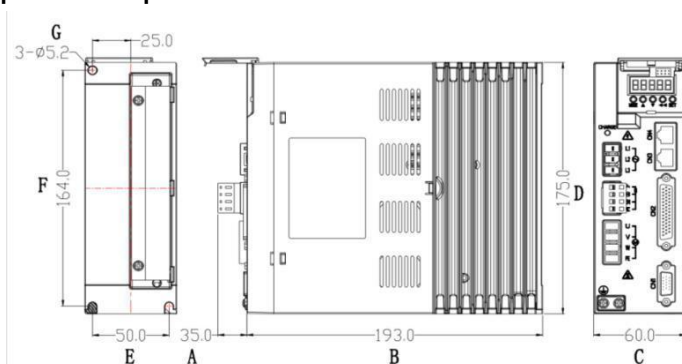
Single phase/three phase 220V: 100w~750w



Single-phase/three-phase 220V:

1.0kw~1.5kw (without fan)

Single-phase/three-phase 220V:

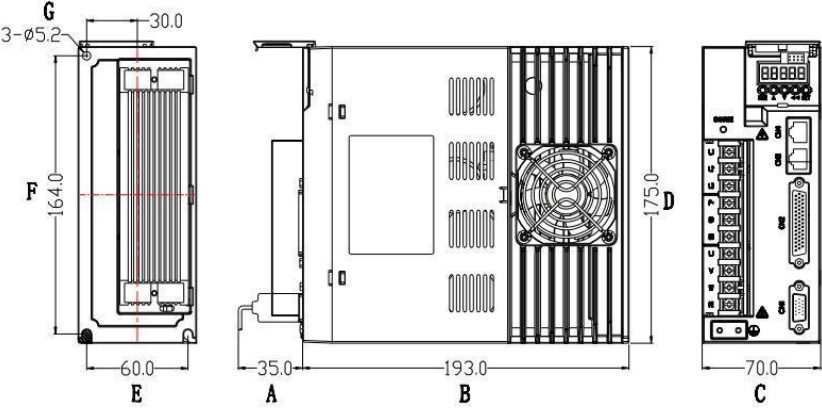


1.8kw~2.6kw (with fan)

model	weight (kg)	A(mm)	B(mm)	C(mm)	D(mm)	AND(mm)	F(mm)	G(mm)
1.0kw~1.5kw	1.55	35	193	60	175	17.5	164	5.2
1.8kw~2.6kw	1.55	35	193	60	175	17.5	164	5.2

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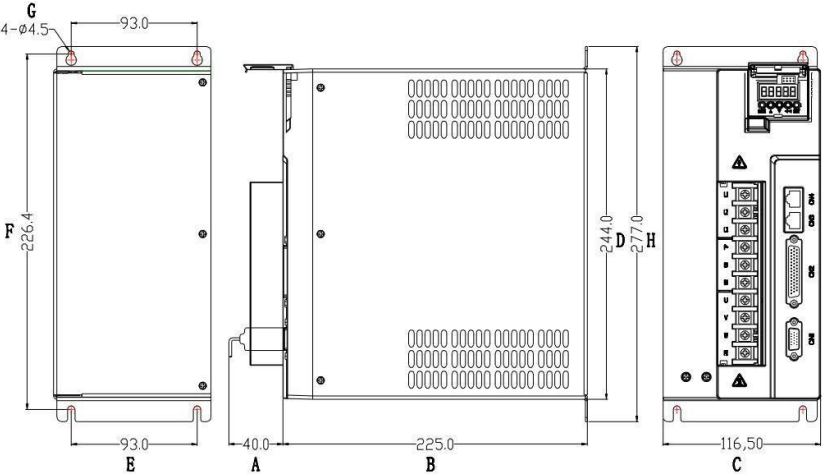
Three-phase 220V:
2.3kw~3.8kw Three-phase
380V: 1.0kw~4.5kw



mode 1	weigh t (kg)	A (mm)	B (mm)	C (mm)	D (mm)	AND (mm)	F (mm)	G (mm)
Three-phase 220V: 2.3kw~3.8kw	1.85	35	193	70	175	60	164	5.2
Three-phase 380V: 1.0kw~4.5kw	1.85	35	193	70	175	60	164	5.2

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Three-phase 220V:
3.0kw~7.5kw Three-phase
380V: 4.3kw~11kw



mode 1	weight (kg)	A (mm)	B (mm)	C (mm)	D (mm)	AND (mm)	F (mm)	G (mm)
Three-phase 220V: 3.0kw~7.5kw	4.55	40	225	116.5	244	93	226	4.5
Three-phase 380V: 4.3kw~11kw	4.55	40	225	116.5	244	93	226	4.5

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警告

- 本系列驱动器电源为 220V 交流供电,接线时必须查明驱动器的使用电源。
- 用户在使用本产品时务必在设计与装配时考虑安全防护措施,以防因错误的操作引起意外事故。
- 驱动器端子 U、V、W 必须与电机 U、V、W 一一对应。
- 驱动器必须和电机有良好的接地。
- 在拆卸本驱动器前必须断电 5 分钟以上,防止电击。
- 禁止频繁开/关电源,的确需要反复开关电源的,请控制在 1 分钟 1 次以下。

2.1 main circuit wiring

2.1.1 Main circuit terminal name

- 100W~1.5KW

Terminal identifi cation	name	illustrate
L1	Single phase 220V	Connect to single-phase 220V.
L2		
NC		no wiring required
P+	Brake resistor terminal	When leaving the factory, B and B1 are short-circuited, and the built-in braking resistor is used. When the braking amount is too large and a large braking resistor needs to be replaced, the short wires B and B1 can be disconnected, and the external braking resistor can be connected to the P+ and B terminals.
B		
B1		
IN	Motor power line and ground terminal	Connected to the motor, must correspond to the U, V, W, PE terminals of the motor one by one.
IN		
IN		
ON		

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● 1. 8KW~2. 6KW

Terminal identifi cation	name	illustrate
L1	Three-phase 220V	Connect to three-phase 220V.
L2		
L3		
P+	Brake resistor terminal	When leaving the factory, B and B1 are short-circuited, and the built-in braking resistor is used. When the braking amount is too large and a large braking resistor needs to be replaced, the short wires B and B1 can be disconnected, and the external braking resistor can be connected to the P+ and B terminals.
B		
B1		
NC	dangling	no wiring required
IN	Motor power line and ground terminal	Connected to the motor, must correspond to the U, V, W, PE terminals of the motor one by one.
IN		
IN		
ON		

● 2. 3KW~4. 5KW

Terminal identifi cation	name	illustrate
L1	Three-phase 220V	Connect to three-phase 220V.
L2		
L3		
P+	Brake resistor terminal	When leaving the factory, B and B1 are short-circuited, and the built-in braking resistor is used. When the braking amount is too large and a large braking resistor needs to be replaced, the short-circuit wires B and B1 can be disconnected, and the external braking resistor can be connected to the P+ and B terminals.
B		
B1		
IN	Motor power line and	Connected to the motor, must correspond to the U, V, W, PE terminals of the motor one by one.
IN		

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● 1.8KW~2.6KW

IN	ground	
ON	terminal	

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● 4. 5KW~7.5KW

Terminal identifi- cation	name	illustrate
L1	Three-phase 220V	Connect to three-phase 220V.
L2		
L3		
P+	Brake resistor terminal	An external braking resistor is required, disconnect the short wires B and B1, and connect the external braking resistor to the P+ and B terminals.
B		
B1		
IN	Motor power line and ground terminal	Connected to the motor, must correspond to the U, V, W, PE terminals of the motor one by one.
IN		
IN		
ON		

2.1.2 Power line selection

(1) Wire cross-sectional area U, V, W wire cross-sectional area $\geq 1.5\text{mm}^2$ (AWG14-16), R, S terminal, wire cross-sectional area $\geq 1.0\text{mm}^2$ (AWG16 ~ 18).

(2) Grounding: The grounding wire should be as thick as possible, the driver and the servo motor are grounded at one point of the PE terminal, and the grounding resistance is $<100\Omega$.

The terminal connection adopts SVM2-4 pre-insulated cold-pressed terminals, and the connection must be firm. It is recommended to be powered by a three-phase isolation transformer to reduce the possibility of electric shock. It is recommended that the power supply be supplied by a noise filter to improve the anti-interference ability. Please install a non-fuse type (NFB) circuit breaker so that the external power supply can be cut off in time when the drive fails.

2.1.3 Signal line selection

(1) Wire material selection: Use shielded cable (twisted shielded cable is best), the cross-sectional area of the wire core

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²
≥0.12mm (AWG24~26), the shielding layer must be connected to the FG terminal.

(2) Cable length: The cable length should be as short as possible, the control CN1 cable should not exceed 3 meters, and the feedback signal CN2 cable should not exceed 20 meters.

(3) Wiring: keep away from the power line wiring to prevent interference from entering. Please install surge absorbing elements for the inductive elements (coils) in the relevant lines. When wiring, no sharp objects can damage the cables, and the cables cannot be pulled strongly.

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Otherwise, it may cause electric shock or poor wiring. Do not pass the main circuit wire and the signal wire through the same pipe, and do not bind them together. When wiring, the main circuit wiring should be wired separately from the signal line or cross-wiring, with a distance of more than 30cm, to prevent the strong current line from interfering with the signal line, so that the drive unit cannot work normally.

(4) Do not add power capacitors, surge absorbers and radio noise filters between the output side of the drive unit and the servo motor. The main circuit wiring and signal lines should not be close to the cooling device and the motor, so as not to reduce the insulation performance due to heat. After the main circuit connection is completed, the terminal protection cover must be covered to avoid electric shock.

2.1.4 Selection of Brake Resistor

The power of the braking resistor of the 220V power supply is related to the load inertia, running speed, and acceleration/deceleration time. The resistance value of the braking resistor is constant and must be in accordance with the standard. It cannot be lower than 45Ω and cannot be higher than 60Ω.

server Driver	Braking resistor			
	Resistance value of braking resistor	power	encap sulat ion	Wiring
0.10~0.75KW	50 Ω（±10%）	500W	Alumi num shell	external
0.10~0.75KW	50 Ω（±10%）	100W	Alumi num shell	built-in
1.0~2.6KW	50 Ω（±10%）	500W	Alumi num shell	external

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1.0~2.6KW	50 Ω ($\pm 10\%$)	200W	Aluminum shell	built-in
2.3~3.8KW	50 Ω ($\pm 10\%$)	800W	Aluminum shell	external
2.3~3.8KW	50 Ω ($\pm 10\%$)	200W	Aluminum shell	built-in
4.5~7.5KW	50 Ω ($\pm 10\%$)	1500W	Aluminum shell	external

1. The load inertia is large, the running speed is high, and the acceleration and deceleration time is short, which can increase the power of the braking resistor and reduce the heating of the braking resistor

2. To reduce braking, you can increase the acceleration and deceleration time

3. When the braking amount is too large, the parameter P2-02 of the drive can be appropriately reduced. The default value is 280, which can be set according to the actual situation, not less than 120

4. When adjusting the acceleration and deceleration time of the upper computer and the parameters of the driver, the braking amount is still very large, and the heating of the braking resistor exceeds 100° C. It is necessary to adopt a fan cooling method and make a special cooling box for the braking resistor.

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2.2 CN2 Wiring

2.2.1 CN2 interface definition table

1	COM+	External power +24V	Remark
16	GND	Servo internal digital ground	
13	SON	Servo enable	
12	CCWL	CCW prohibited	I/O import
38	COOL	CW banned	I/O import
37	IN	CCW torque limit	I/O import
10	RIL	CW torque limit	I/O import
11	EMGS	Servo emergency stop	I/O import
24	SPD0	switch selection 0	I/O import
23	SPD1	switch selection 1	I/O import
22	SPD2	switch selection 2	I/O import
35	HEARTS+	ready signal	I/O export
36	HEARTS-	ready to signal	
6	ALRM+	Servo alarm output signal	I/O export
7	ALRM-	Servo alarm output signal ground	
4	ZSPD+	positioning complete signal	I/O export
5	ZSPD-	positioning completion signal	
2	TSPD+	speed arrival signal	I/O export
3	TSPD-	speed arrival signal	
39	BRKR+	Electromagnetic brake signal	I/O export
40	BRKR-	Electromagnetic brake signal ground	
6	ALRM+	Servo alarm output signal	I/O export
7	ALRM-	Servo alarm output signal ground	
8	CZ+	Z phase pulse collector output signal	I/O export
9	CZ-	Z phase pulse collector output	

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		signal ground	
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30	A+	Servo encoder pulse feedback A+	
29	A-	Servo encoder pulse feedback A-	
28	B+	Servo encoder pulse feedback B+	
27	B-	Servo encoder pulse feedback B-	
26	Z+	Servo encoder pulse feedback Z+	
25	WITH-	Servo encoder pulse feedback Z-	
42	PULSE	Command pulse input signal	
43	/PULSE	Command pulse input signal ground	
14	SIGN	Command pulse direction input signal	
15	/SIGN	Command pulse direction input signal ground	

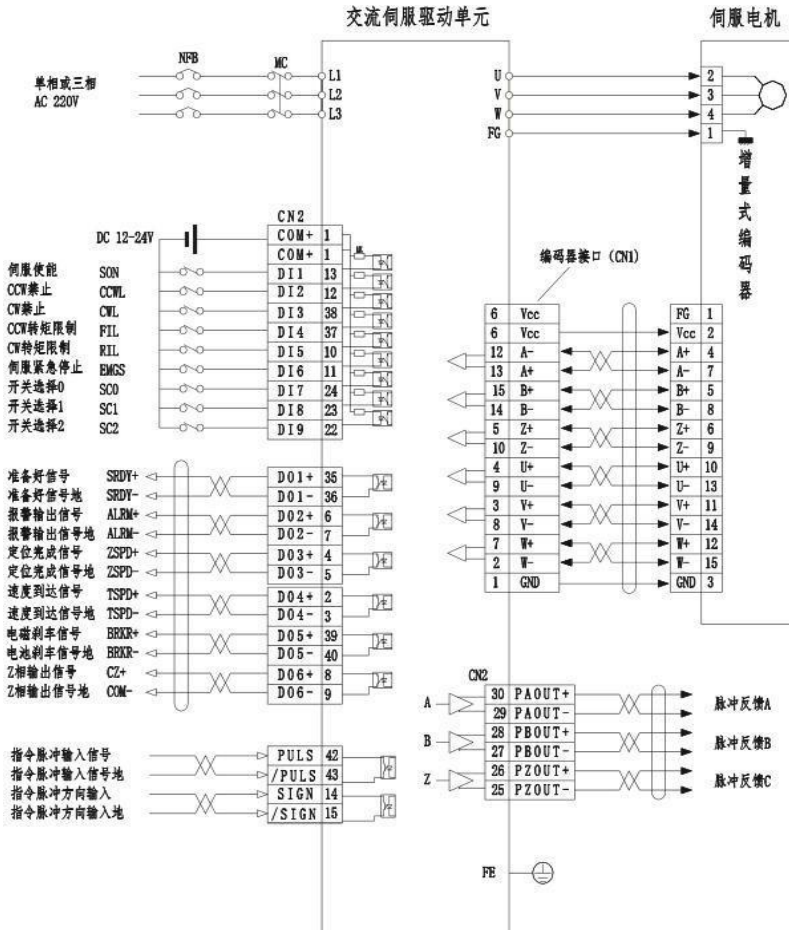
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2.2.3 CN2 Interface Wiring Diagram

1, position control wiring

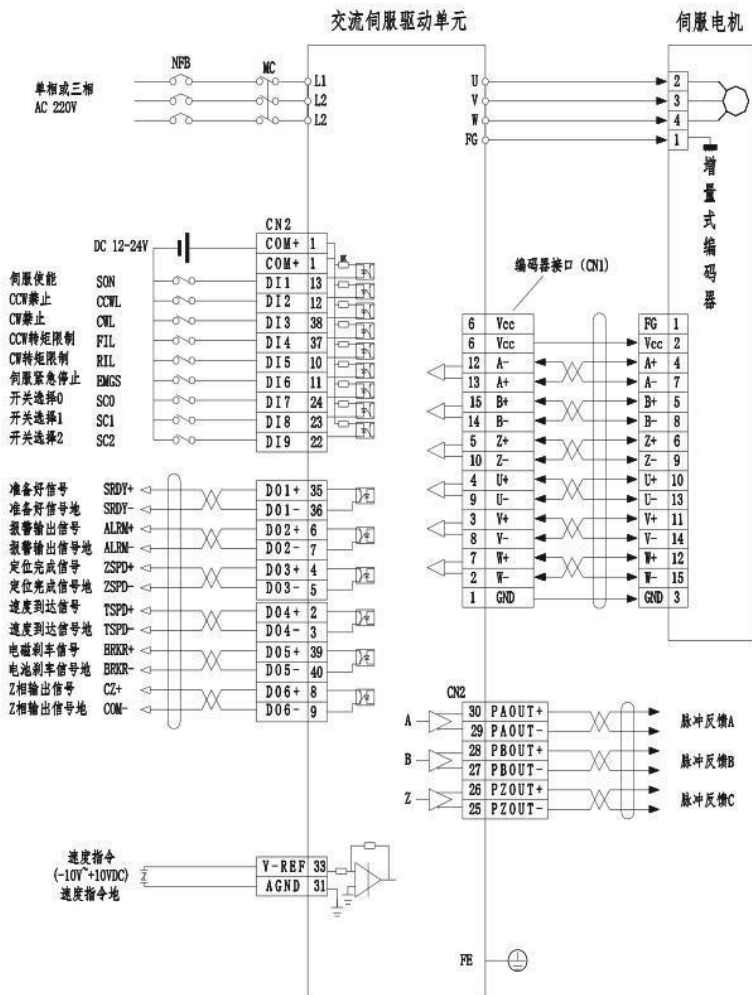
P



DPX200-P1 Position control standard wiring diagram

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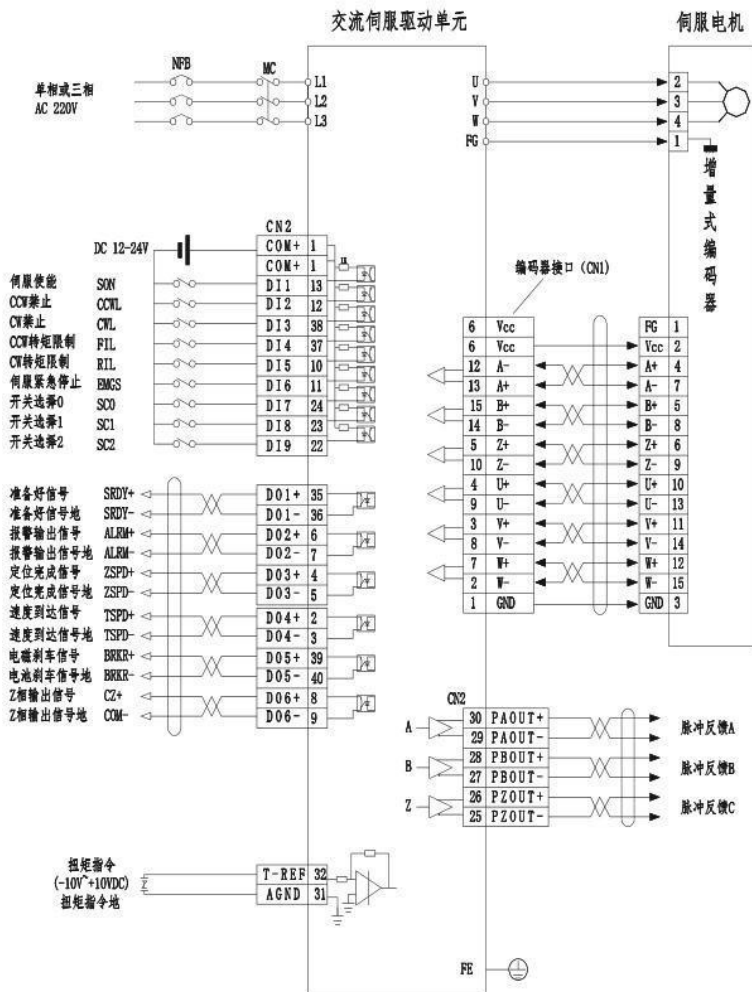
2, Speed control wiring mode (analog voltage)



DPX200-P1 Speed control (analog voltage mode)
standard wiring

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3, Torque control wiring mode (analog voltage)



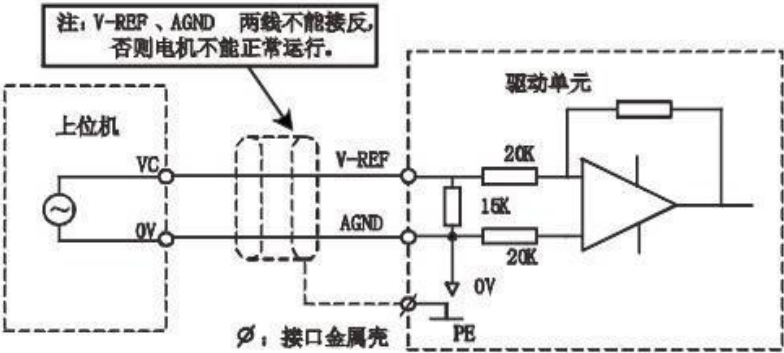
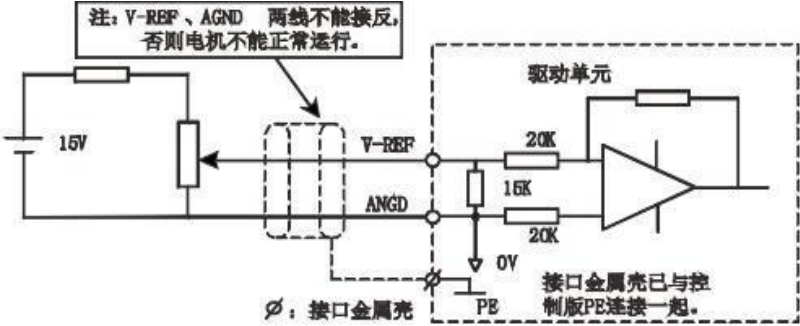
DPX200-P1 Speed control (analog voltage mode)
standard wiring

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2.2.4 CN2 Interface Circuit

① Speed analog command input signal

V-REF+(CN2-2)/GND(CN2-14) It is the input terminal of the speed analog command, the maximum receiving 10V DC voltage signal, the port input impedance is 20K ohm.



② Position command input signal

foot number	Signal name	name	type
25	PULSE	Command pulse input signal	enter
13	/PULSE	Command pulse input signal ground	enter
24	SIGN	Command pulse direction input signal	enter
12	/SIGN	Command pulse direction input	enter

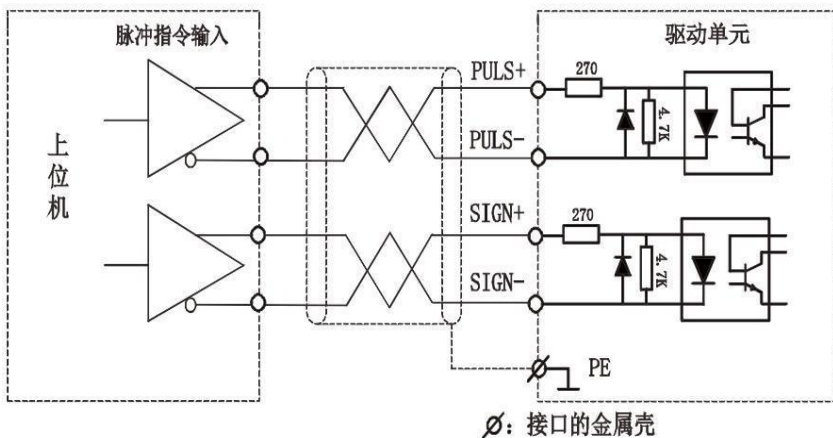
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		signal ground	r
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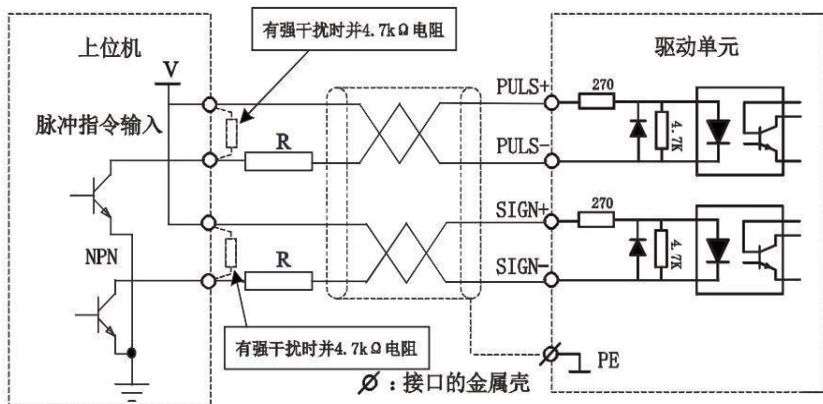
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A, The user can use the differential drive connection method, or the single-end drive connection method, the example is as follows:

1, differential drive

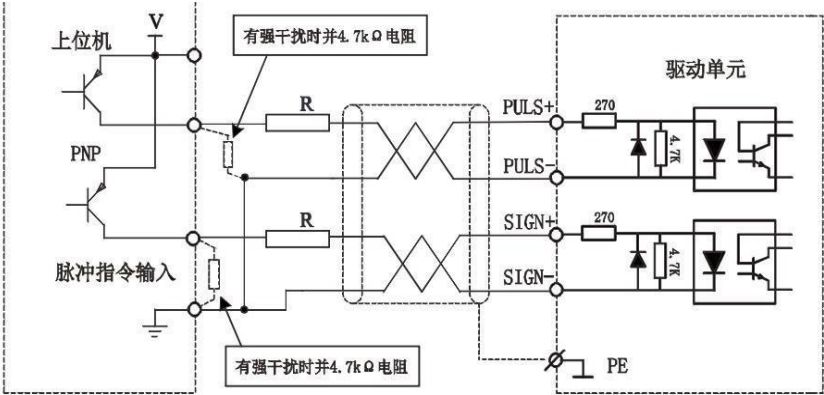


2, single-ended drive



(a) NPN 型单端驱动接线

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(b) PNP 型单端驱动接线

B, Pulse input mode selection

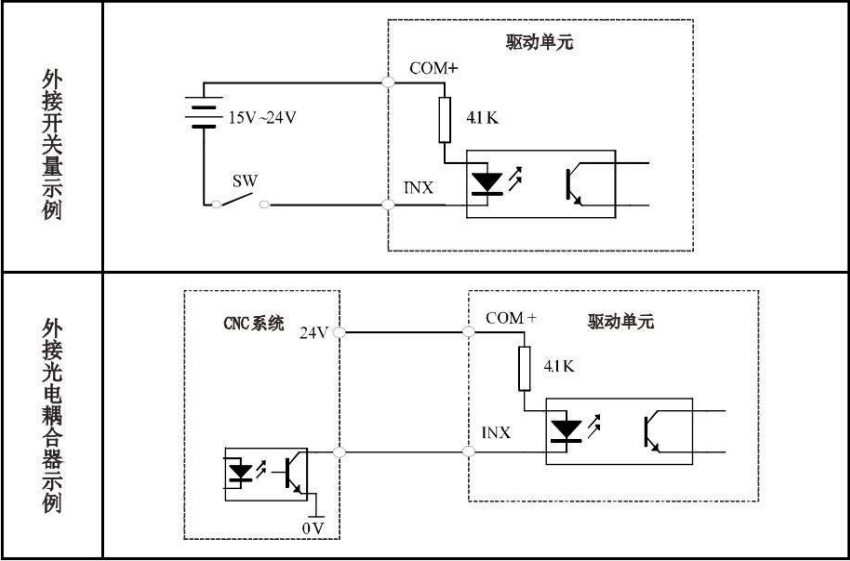
The position command input modes that can be received are:6 species, by parameterP1-02For setting, see the table below, and the arrow marks

脉冲指令模式	CCW	CW	参数设定值
脉冲	PULS	PULS	P1-02=0, 1, 2, 3 指令脉冲+方向
方向	SIGN	SIGN	
CCW脉冲	PULS	PULS	P1-02=4, 5 CCW脉冲+CW 脉冲
CW脉冲	SIGN	SIGN	

the counting edge.

③ Switch input signal

Servo unit no24VPower output, switch signal input needs to be configured externally24Vusing electric. Specification requirements:DC15V~24V, 100mA above. It is recommended to use the same power supply as the output circuit.COM+ (CN2-20) is the positive pole of the external power supply, and the common wiring examples are given below,INXMark the entry point.



SON (CN2-6)forON， turn on the servo enable, check the monitoring windowFn-20, will display “Rn-on”

Relate d parame ters number	sign ific ance	unit	default value	Applicab le method

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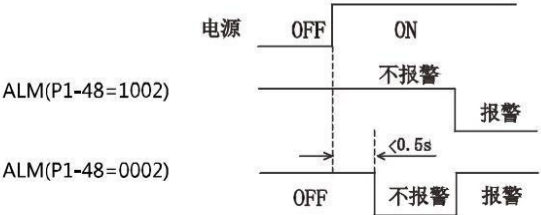
P1-04	<p>without externalSON In the case of an input signal, the drive unit is internally enabled</p> <p>P1-04=0:Only when be sure to input signalSON for ON, the motor can be enabled.</p> <p>P1-04=1:The drive unit internally forces the motor to be enabled, without the need for an external input signalSON。</p> <p>P1-04After setting, press theSET More than three seconds, appearsSAVE, The parameters are saved</p>		0	P S
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④Switch output signal

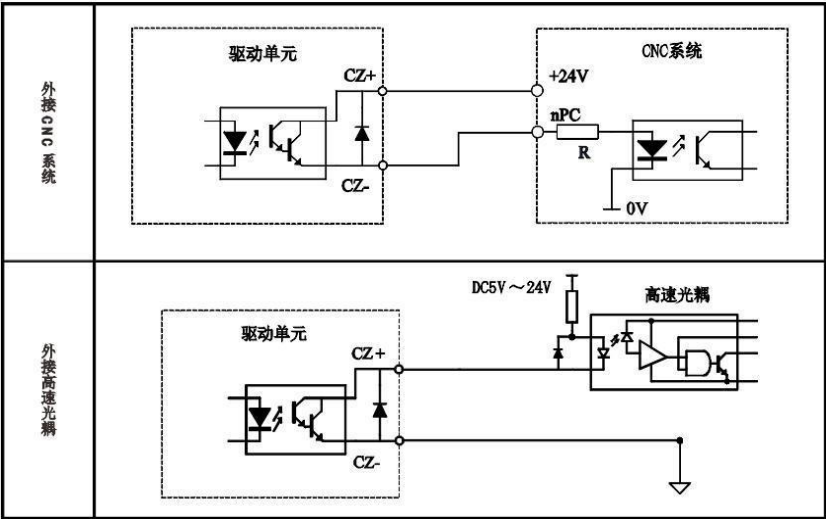
1、ALRM+(CN2-17)/ALRM-(CN2-5)It is the output signal when the drive unit detects an abnormality, and the output status is the same

P1-48 = 2	驱动单元报警时，ALM 与 DG 导通。
P1-48 = 1002	驱动单元报警时，ALM 与 DG 关断。

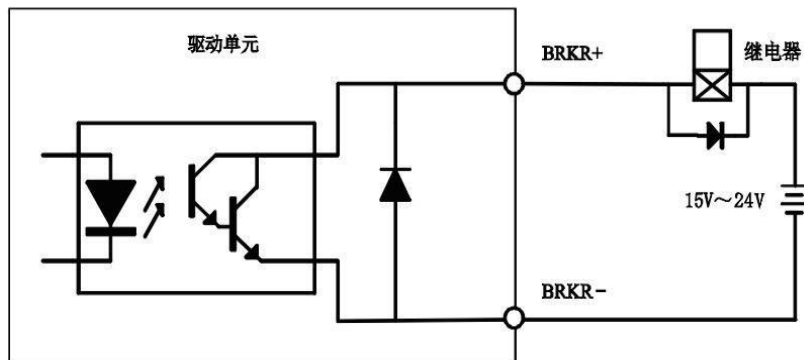


asP1-48related.

2、CZ+ (CN2-16) /CZ- (CN2-4) Position feedback outputWITHPulse signal, that is, the encoder feedback one-rotation signal.

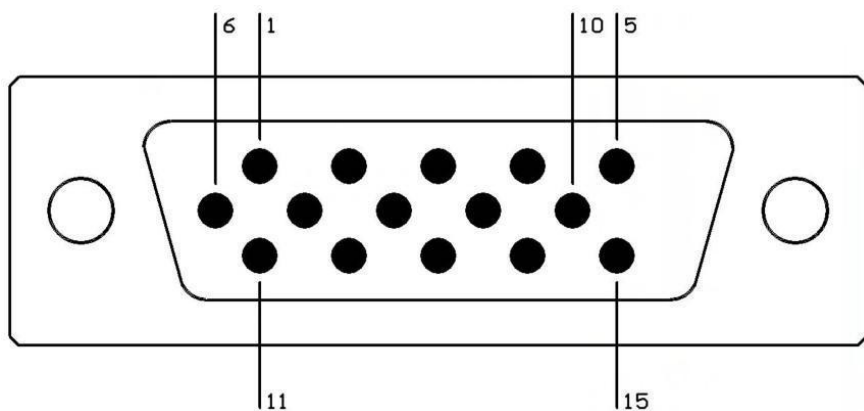


3、BRKR+(CN2-15)/BRKR-(CN2-3)Brake release signal, external relay.



2.3 CN1Wiring

2.3.1 CN1Interface diagram (welding wire end)



Front screenshot of DSL200-F1 CN1 interface welding wire end

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2.3.2 CN1interface definition table

pin number	pin definition	Symbol content	Remark
6	VCC	Servo internal +5V	
1	GND	Servo internal 0V	
13	A+	Encoder input A+	twisted pair
12	A-	Encoder input A-	
15	B+	Encoder input B+	twisted pair
14	B-	Encoder input B-	
5	Z+	Encoder input Z+	twisted pair
10	WITH-	Encoder input Z-	
4	U+	Encoder input U+	twisted pair
9	IN-	Encoder input U-	
3	V+	Encoder input V+	twisted pair
8	IN-	Encoder input V-	
7	W+	Encoder input W+	twisted pair
2	IN-	Encoder input W-	

2.3 Communication terminal connection and description (CN3、CN4)

2.3.1 CN3、CN4 interface definition table

CN3 (the plane end of the crystal head is from left to right)			CN4 (the plane end of the crystal head is from left to right)		
pin number	pin definition	Description of content	pin number	pin definition	Description of content
5	RS-485-	RS485 data signal-	5	RS-485-	RS485 data signal-
6	RS-485+	RS485 data signal+	6	RS-485+	RS485 data signal+
1	GND	digital signal ground	1	GND	digital signal ground

2.3.2 Communication Description

Baud rate: 38400Bps

(default) Data length: 8 bits

Start bit: 1

stop bit: 1

check bit:

none

Note: When communicating with multiple machines, please set the station number of the servo slave station correctly

Display and operation

3.1 Panel Appearance

①Panel Appearance



② Panel function keys


The panel of the drive unit consists of 5 LED digital displays and 5 keys, which are used to display various statuses, setting parameters, etc.


The key functions are as follows:

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▲: Serial number, numerical increase, or options forward

▼: serial number, value decrease, or

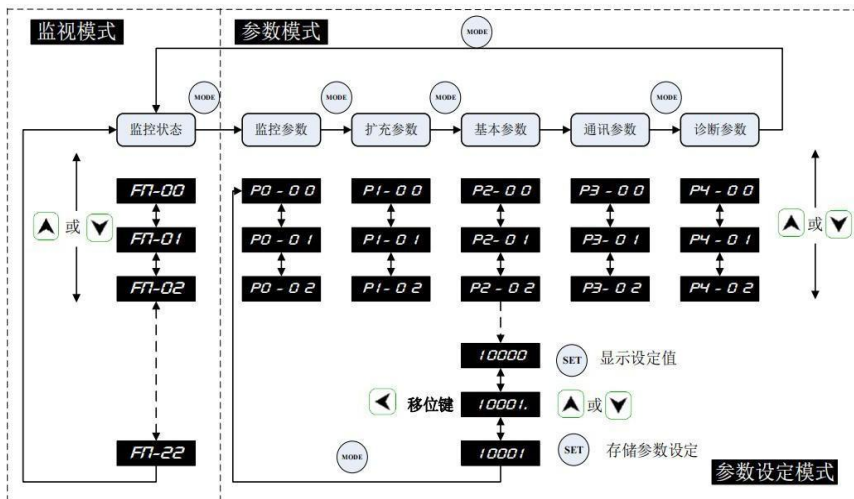
option backward : Enter the next layer of operation menu, or enter to

confirm : Return to the previous operation menu, or cancel the operation

←: Shift key to move the flashing number to the left

Note: keep pressing, the operation is repeated, and the longer the hold time, the faster the repetition rate

③Parameter setting process





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(1) When the driver is powered on, the display will first display the monitoring display symbol for one minute, and then enter the speed monitoring display mode



(2) In monitor mode Fn-xx press  or  key to switch monitoring parameters.

(3) In monitor mode, if you press  key to freely switch between

monitoring mode and parameter mode, in parameter mode, press  or  After the key can be changed


Two-character parameter code.




(4) In parameter mode press , the system enters the setting mode, and the display will display the setting value corresponding to this parameter at the same time. Available at this time  or

 key to modify the parameter value or press  key to leave the setting mode and return to the parameter mode, when modifying the parameters,

A decimal point appears in the lower right corner of the parameter value.

(5) After the set value is corrected, press  key to store parameters or execute commands.

(6) After completing the parameter setting, the decimal point of the display will disappear, press  key to switch to other parameters or monitor mode.

(7) In edit setting mode, press the  key to move the flashing decimal point to the left in a circle.  or  key to quickly modify the higher setting value.

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3.2 menu

3.2.1 Menu Summary

menu code	submenu name	Func tion
Fn-00~Fn-23	monitoring status	Display the status information of the servo drive, such as speed, current, etc.
P0-00~P0-08	Monitoring parameters	Display the software and hardware version of the servo drive and the factory parameter reply
P1-00~P1-64	Extended parameters	Setting the corresponding parameters can expand the servo drive some functions etc.
P2-00~P0-62	Basic parameters	Commonly used parameter settings by users, such as three-ring parameters, product Divide time, etc.
P3-00~P3-06	Communicat ion parameters	Realize the communication with the upper computer,485 communication
P4-00~P4-56	Extended parameters	Extended parameter setting of control mode and some reports police diagnosis

3.2.2 parameter settings

Restore Defaults:When the manufacturer leaves the factory, in the servo driver, the corresponding motor parameters will be set for each motor type, set according to the motor model

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codeP1-05parameter value, andP0-02Set as 1After that, the current parameter value will automatically restore to the default value.

Related paramet ers	name	unit	paramet er range	default value	Applicabl e method
P1-05	motor model the code		1~200	0	Pt, s
P0-02	perform an operatio n the code		0~2	0	Pt, s

4.1 parameter definition

The parameter definitions are divided into the following five categories. Parameter start codeP The first character after is a group character, and the next two characters are parameter characters. The communication address is composed of group characters and sixteen-bit values of the two parameter characters. The parameter group is defined as follows:

group0: Monitoring parameters
(Example:P0-xx) group1: Basic parameters (Example:P1-xx)
group2: Function parameters
(Example:P2-xx) group3: Communication parameters
(Example:P3-xx) group4: Extended parameters
(Example:P4-xx) group5: Running monitor (Example:Fn-xx)

4.1.2 Description of control mode

DSL200 series has a variety of built-in control modes, which can be selected by setting the value of P1-00, as shown in the following table:

P1-00	control mode	schema content	schema description
0	Pt	external position control	External pulse command input
1	Pr	internal position control	① Internal parameter input, running speed and position are selected through the pin planning of POS1, POS2, POS3 ②Internal position control with inching function ③The internal position requires the external trigger signal to be valid to run

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2	S	speed control (without zero fix function)	①When SPD1, SPD2, and SPD3 are all OFF, the speed is determined by V-REF (CN2_3) Analog voltage control ②When any one of SPD1, SPD2, SPD3 is ON, the speed is controlled by selecting the parameters in P4-44~P4-50 through the I/O signal
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P1-00	control mode	schema content	schema description
3	T	torque control	<p>①When SPD1, SPD2, SPD3 are all OFF, the torque value is passed through T-REF (CN2_1) analog voltage control, the speed is controlled by V-REF (CN2_3) analog voltage</p> <p>②When any one of SPD1, SPD2, SPD3 is ON, the torque is controlled by the parameter P4-09, and the speed is controlled by selecting the parameters in P4-44~P4-50 through the I/O signal</p>
4	Zero	torque control (with zero position fix function)	<p>① When SPD1, SPD2, and SPD3 are all OFF, the motor is in a fixed state</p> <p>②When any one of SPD1, SPD2, SPD3 is ON, the torque is controlled by the T-REF (CN2_1) analog voltage, and the speed is controlled by the I/O signal selection parameters in P4-44~P4-50</p>
5	Zero	speed control (with zero position fix function)	<p>①When SPD1, SPD2, and SPD3 are all OFF, the speed is determined by V-REF (CN2_3) Analog voltage control</p> <p>②When any one of SPD1, SPD2, SPD3 is ON, the speed is controlled by selecting the parameters in P4-44~P4-50 through the I/O signal</p>
6	Pt_Zero	speed control (with zero position fixation function) transfer to external position control	<p>①Ps and Pt are switched by planning the I/O pin function as MDC</p> <p>②When MDC=0 and SPD1, SPD2, SPD3 are all OFF, the speed is controlled by V-REF (CN2_3) analog voltage</p> <p>③When MDC=0 and any one of SPD1, SPD2, SPD3 is ON, the speed is controlled by I/O signal selection parameters in P4-44~P4-50</p> <p>④When MDC=1, it works under external pulse position control</p>





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P1-00	control mode	schema content	schema description
7	Pt_Tt	External position control to torque control	<p>①Pt and T are switched by planning the I/O pin function as MDC</p> <p>②When MDC=0, it works under external pulse position control</p> <p>③When MDC=1 and SPD1, SPD2, SPD3 are all OFF, the torque is controlled by T-REF (CN2_1) analog voltage, and the speed is controlled by V-REF (CN2_3) Analog voltage control</p> <p>④When MDC=1 and any one of SPD1, SPD2, SPD3 is ON, the torque is controlled by T-REF (CN2_1) analog voltage, and the speed is controlled by I/O signal selection parameters in P4-44~P4-50</p>
8	Pr_Si	Internal Position and Internal Velocity Conversion	<p>①Pr and Si are switched by planning the I/O pin function as MDC</p> <p>②When MDC=0, it works under internal speed control, and the internal speed selection is selected by the combination of I/O pin planning SPD1, SPD2, and SPD3</p> <p>③When MDC=1 works in the internal position control, the position and speed to be operated are selected by the combination of POS1, POS2 and POS3 according to the I/O pin planning</p>
10	PtTt	Position control with torque limiting	<p>①The position and speed are controlled by external pulse command</p> <p>②When P1-03 = 0, the torque adjustment is controlled by the input analog voltage of T-REF (CN2_1)</p> <p>③When P1-03 =1, the torque adjustment is given by the parameter value of P4-09</p>
11	Sr	speed test run	P4-02 can adjust the running speed of the motor, and the parameters will not be saved after power off
12	JOG	jog run	P4-00 can adjust the running speed of the motor, and the parameters will not be saved after power off

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P1-00	control mode	schema content	schema description
13	OL	test method	P4-01 can adjust the running speed of the motor, and the parameters will not be saved after power off
14	CO	Encoder zeroing	It is mainly used to adjust the zero point magnetic pole position of the absolute encoder motor, which is used by the manufacturer
15	ON	open loop operation	Factory use
16	Pt_Tt	External position to external torque control	<p>①Pt and Tt are switched by planning the I/O pin function as MDC</p> <p>②When MDC=0, it works under external pulse position control</p> <p>③When MDC=1, it works under external torque control, and the torque is given by the external analog voltage input pin T-REF (CN2_1)</p>

4.2 monitoring status

In menu level 1, press the  key to switch to the first-level menu of monitoring status, the user can use 、 to select the desired display mode, then press  Press the key to enter the secondary menu of the monitoring status, where the status can be displayed in detail.

4.2.1 DSL200-P1 Series (Incremental 2500 Lines)

A menu	Function Description	Secondary menu	Description of content	mailing address (decimal)
Fn - 01	The lower 4 bits of the current position (pulse)	P 5806	Current position 145806 pulses	4x1281
Fn - 02	High 4 bits of current position (×10000 pulses)	P. 14		4x1282

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Fn - 03	Lower 4 bits of position command (pulse)	C 5810	Position command 145810 pulses	4x1283
Fn - 04	High 4 bits of position command (×10000 pulses)	C. 14		4x1284
Fn - 05	Position deviation lower 4 bits (pulse)	AND 4	Position deviation 4 pulses	4x1285
Fn - 06	High 4 bits of position deviation (×10000 pulses)	E. 0		4x1286
Fn - 07	Position command pulse frequency (kHz)	F 12.6	Position command pulse frequency 12.6kHz	4x1287
Fn - 08	Motor speed (r/min)	R 1000	Motor speed 1000r/min	4x1288
Fn - 09	Speed analog command input (V)	S 2.5	Speed analog voltage 2.5V	4x1289
Fn - 10	Speed analog command input (rpm)	S. 750	Speed simulation command 750r/min	4x1290
Fn - 11	Torque analog command input (V)	T 2.5	Torque analog voltage 2.5V	4x1291
Fn - 12	Torque analog command input (%)	T. 25	Torque simulation command 25%	4x1292
Fn - 13	Average current (A)	I 2.3	Average current 2.3A	4x1293
Fn - 14	Peak current (A)	I. 3.5	Peak current 3.5A	4x1294
Fn - 15	Number of motor feedback pulses (relative value)	A 3265	Rotor absolute position value 3265	4x1295
Fn - 16	Number of motor feedback pulses (absolute value)	A. 0		4x1296
Fn - 17	Input state terminal	In 1111	input terminal	4x1297
Fn - 18	Output terminal state	Out 11	output terminal	4x1298
Fn - 19	Encoder value input signal	Cod --	Encoder signal	4x1299
Fn - 20	Servo running status	Rn On	running	4x1300

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Fn - 21	alarm code	BUT 9	Alarm 9	4x1301
Fn - 22	External speed analog voltage input display	In 0.000	External input speed analog circuit Voltage is 0.000V	4x1302
Fn - 23	External torque analog voltage input display	In 0.000	External input torque analog electric Voltage is 0.000V	4x1303
Fn - 24	Servo alarm times memory	AC 8	Servo alarmed 8 times	4x1304

4.3 List of parameters

4.3.1 Monitoring parameters

parameter	Function code description	Applicable method	Predetermined area	Factory default	unit	mailing address (decimal)
P0-00	Software version	P S T		407	/	4x0000
P0-01	hardware version	P S T		200	/	4x0001
P0-02	Parameter default value recovery 0: no operation 1: Restore factory parameter settings 2: Absolute encoder motor zero position setting (for factory use)	P S T	0~2	0	/	4x0002
P0-03	Software Reset 0: No operation 1: Servo software reset	P S T	0~1	0	/	4x0003
P0-04	Last alarm code 1	P S T		0	/	4x0004
P0-05	Last alarm code 2	P S T		0	/	4x0005
P0-06	Last alarm code 3	P S T		0	/	4x0006
P0-07	Last alarm code 4	P S T		0	/	4x0007
P0-08	Last alarm code 5	P S T		0	/	4x0008

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4.3.2 Extended parameters

parameter	Function code description	Applicable method	Predetermined area	Factory default	unit	mailing address (decimal)
P1-00	Control mode selection See 5.7 Control Mode Definition Table for details	P S T	0~100	0	/	4x256
P1-01	Pulse command direction and encoder feedback output direction setting 0: Command pulse direction logic positive, encoder feedback direction logic positive 1: Command pulse direction logic negative, encoder feedback direction logic positive 2: Command pulse direction logic positive, encoder feedback direction logic negative 3: Command pulse direction logic negative, encoder feedback direction logic negative Feedback Direction Logic Negative	P	0~3	0	/	4x257
P1-02	External pulse train command input form setting 0: pulse + direction 4: CCW/CW pulse 6: A/B phase pulse	P	0~7	0	/	4x258

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P1-03	Control command input source setting 0: Control command terminal given 1: Control command ModBusRTU communication setting (such as RS-232, RS-485) 2: Control command Can communication given	P S T	0~2	0	/	4x259
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P1-04	Internal servo start setting 0: Servo disabled 1: Servo enable After setting this parameter, you need to press and hold the "SET" button for about 3 seconds. When "SAVE" is displayed, it means that the parameter value is saved, otherwise the modified value is not saved.	P S T	0~1	0	/	4x260
P1-05	Motor model code: When P0-02=1, the servo automatically restores the parameter factory value according to the motor model code	P S T	0~100	2	/	4x261
P1-06	Electronic gear ratio numerator (N)	P	1~32767	1	/	4x262
P1-07	Electronic gear ratio numerator (N2) (※)	P	1~32767	1	/	4x263
P1-08	Electronic gear ratio numerator (N3)	P	1~32767	1	/	4x264
P1-09	Electronic gear ratio numerator (N4)	P	1~32767	1	/	4x265
parameter	Function code description	Applicable method	Predetermined area	Factory default	unit	mailing address (decimal)
P1-10	Electronic gear ratio denominator (M)	P	1~32767	1	/	4x266
P1-11	Detector output pulse number setting	P S T	0~32767	2500	P/r	4x267
P1-12	Motor stop mode function 0: free stop, long stop time 1: Inert stop, short stop time 2: reserved	P S T	0~2	0	/	4x268
P1-13	Maximum rotation speed of analog speed command: the maximum speed corresponding to the analog input ± 10	S	-6000~6000	3000	rpm	4x269
P1-14	Analog torque command maximum output	T	0~6000	100	rpm	4x270

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P1-15	Analog torque command maximum output: Maximum torque corresponding to analog input ±10	T	0~500	100	%	4x271
P1-16	Motor overspeed alarm detection threshold	P S T	0~6000	3000	rpm	4x272

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P1-17	Analog speed/torque input hardware drift automatic correction 0: no operation 1: Analog speed/torque input channel hardware zero drift automatic correction	S T	0~1	0	/	4x273
P1-18	Analog Speed Input Hardware Drift Manual Correction	S	-4096~4096	0	/	4x274
P1-19	Analog torque input hardware drift manual correction	T	-4096~4096	0	/	4x275
P1-20	Analog Speed Input Proportional Gain	S	20~3000	1000	0.001	4x276
P1-21	Analog speed command voltage forward gain	S	20~3000	1000	0.001	4x277
P1-22	Analog speed command voltage negative gain	S	20~3000	1000	0.001	4x278
P1-23	Zero speed analog command voltage clamping:	S	-6000~6000	20	5mV	4x279
P1-24	Analog torque input proportional gain	T	20~3000	1000	0.001	4x280
P1-25	Analog torque command voltage forward gain	T	20~3000	1000	0.001	4x281
P1-26	Analog torque command voltage negative gain	T	20~3000	1000	0.001	4x282
P1-27	Zero-speed torque quasi-command voltage clamping	T	-6000~6000	20		4x283
P1-28	Automatic return to origin mode switch: 0: After the servo obtains the enable signal, it needs an external I/O trigger to return to zero 1: After the servo gets the enable signal, it starts to return to zero automatically 2: Set the origin position, directly take the current position of the absolute encoder as the origin, increment Type encoder setting this value is invalid	P S T	0~2	0	/	4x284
P1-29	Return to origin mode	P S T	0~15	0	/	4x285

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P1-30	The first high-speed homing speed setting	P S T	-3000~3000	200	rpm	4x286
P1-31	The second low-speed homing speed setting	P S T	-3000~	50	rpm	4x287

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			3000			
P1-32	Origin return offset rotation number	P S T	0~32767	0	^x 10000	4x288
P1-33	Origin return offset pulse number	P S T	0~32767	0	pulse	4x289
P1-34	reserve		0~32767	0	pulse	4x290
P1-35	Positioning complete signal output delay time	P	0~10000	0	0.1ms	4x291
P1-36	When the position deviation is less than the number of pulses, the ZSPD signal output is ON	P	0~100	10	pulse	4x292
P1-37	When the motor speed is greater than this speed, the SSPD signal output is ON	S	0~6000	2500	rpm	4x293
P1-38	Digital IO access pin DI1 function planning ① Low 2 is the input pin planning function code (See Table 5.3 for details) ② The third bit indicates that the corresponding servo I/O signal is forced to be valid ③ The 4th bit indicates the inversion of the corresponding servo I/O signal input	P S T	0~1135	1	/	4x294
P1-39	Digital IO access pin DI2 function planning (same as above)	P S T	0~1135	4	/	4x295
P1-40	Digital IO access pin DI3 function planning (same as above)	P S T	0~1135	5	/	4x296
P1-41	Digital IO access pin DI4 function planning (same as above)	P S T	0~1135	6	/	4x297
P1-42	Digital IO access pin DI5 function planning (same as above)	P S T	0~1135	7	/	4x298
P1-43	Digital IO access pin DI6 function planning (same as above)	P S T	0~1135	31	/	4x299
P1-44	Digital IO access pin DI7 function planning (same as above)	P S T	0~1135	24	/	4x300

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P1-45	Digital IO access pin DI8 function planning (same as above)	P S T	0~1135	25	/	4x301
P1-46	Digital IO access pin DI9 function planning (same as above)	P S T	0~1135	26	/	4x302
P1-47	Digital IO output pin D01 function planning ①Low 2 is the output pin planning function code (See Table 5.4 for details) ②The third bit indicates that the forced output is valid ③ The 4th bit indicates the inversion of the output level ④The output signal is an open circuit, the positive terminal is connected to the input port of the host computer, and the negative terminal is connected to 0V of the host computer.	P S T	0~1135	1	/	4x303
P1-48	Digital IO output pin D02 function planning (same as above)	P S T	0~1135	2	/	4x304
P1-49	Digital IO output pin D03 function planning (same as above)	P S T	0~1135	3	/	4x305
P1-50	Digital IO output pin D04 function planning (same as above)	P S T	0~1135	4	/	4x306
P1-51	Digital IO output pin D05 function planning	P S T	0~1135	5	/	4x307
P1-52	reserve					4x308
P1-53	reserve*					4x309
P1-54	reserve					4x310
P1-55	reserve		0~12800	0	0.001	4x311
P1-56	Attenuation coefficient at inertia stop	P S T	0~40	2	/	4x312
P1-57	Inert stop mode selection	P S T	0~1	0	/	4x313
P1-58	Motor model error alarm shielding 0: invalid 1: Shield motor model error alarm	P S T	0~1	0	/	4x314
P1-59	The maximum allowable overload multiple of the motor	P S T	0~500	200	%	4x315
P1-60	Motor rated current	P S T	0~1000	60	0.1A	4x316

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P1-61	The current sampling circuit allows the maximum current	P S T	0~10000	2500	0.01A	4x317
P1-62	reserve					4x318
P1-63	reserve					4x319

4.3.3 Basic parameters

parameter	name	Applicable method	parameter range	default value	unit	communication place site
P2-00	speed control gain When the speed control gain is increased, the performance of the speed response can be improved; but if the setting is too large, vibration and noise will easily occur	P S T	0~1280	155	0.1	4x512
P2-01	speed integral time constant The smaller the speed integral time constant, the faster the speed response and reduce the speed control error, but if the setting is too large, vibration and noise will easily occur	P S T	1~32767	150	0.1ms	4x513
P2-02	Position Control Gain	P S	0~2000	280	0.01	4x514
P2-03	Load inertia ratio of servo motor	P S T	0~1000	100	%	4x515
P2-04	Position Control Feedforward Gain	P	0~1280	0	0.1	4x516
P2-05	Feedforward instruction low-pass filter cut-off frequency	P	1~2000	300	Hz	4x517
P2-06	Position out-of-tolerance detection range	P	0~32767	600	×100	4x518
P2-07	Position out-of-tolerance error detection is valid 0: Do not shield position out-of-tolerance alarm 1: Shield position out-of-tolerance alarm	P	0~1	0	/	4x519
P2-08	Speed gain switching threshold at low speed	P S T	0~6000	100	rpm	4x520
P2-09	Speed gain switching factor	P S T	0~500	100	%	4x521
P2-10	Variation rate of speed gain	P S	0~500	100	%	4x522
P2-11	Position Gain Variation Rate	P	0~500	100	%	4x523

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P2-12	Expert parameter auto-tuning	P S T	0~32	0	/	4x524
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P2-13	Current Control Proportional Gain	P S T	0~6000	750	0.001	4x525
P2-14	Current integration time constant	P S T	1~32767	130	0.1ms	4x526
P2-15	Current sense low pass filter coefficient	P S T	1~2000	25	%	4x527
P2-16	Speed detection low-pass filter coefficient	P S	1~2000	40	%	4x528
P2-17	Velocity Integral Split Point	P S	0~3000	100	rpm	4x529
P2-18	Speed control gain change rate	P S T	100~500	100	%	4x530
P2-19	The third zero speed	P S T		50	rpm	4x531
P2-20	Speed P and PI regulator selection 0: PI regulator Conventional regulator, there is a certain overshoot when the load inertia ratio is large 1: P regulator When the load inertia is relatively large, the P regulator can be used to reduce the overshoot 2: PDFF regulator, between PI and P regulator, can achieve small speed overshoot and quick response to requests	P S	0~2	0	/	4x532
P2-21	Analog command low pass filter cutoff frequency	S T	0~32767	10	0.1ms	4x533
P2-22	Analog speed/torque command average filter time	S T	0~32767	300	0.1ms	4x534
P2-23	Position command smoothing function enable 0: Invalid 1: The position command smoothing function is turned on 2: reserved	P	0~2	0	/	4x535
P2-24	Position command smoothing filter coefficient	P	1~10000	200	/	4x536
P2-25	reserve		0~1000	0		4x537

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P2-26	speed control acceleration time	P S T	0~10000	300	ms	4x538
P2-27	Speed control deceleration time/internal position control Acceleration and deceleration time	P S	0~10000	100	ms	4x539
P2-28	Backlash Compensation: Since there is a certain gap in the pitch of the screw, errors will occur during the forward and reverse rotation of the servo motor. This parameter can be used to compensate for the backlash	P	-30000~30000	0	pulse	4x540
P2-29	Servo response maximum frequency	P S T	10~600	200	Hz	4x541
P2-30	Servo processing mode selection when the torque is reached 0: Output torque reached signal 1: The output torque reaches the signal and the servo motor machine stops running	P S T	0~1	0	/	4x542
P2-31	reserve					4x543
P2-32	Effective detection of power-on and release delay	P S T	0~1	0	/	4x544
P2-33	Electromagnetic brake start delay time	P S T	0~32767	1500	0.1ms	4x545
P2-34	Electromagnetic brake off delay time	P S T	0~32767	10000	0.1ms	4x546
P2-35	Notch Filter 1 Frequency	P S T	10~1000	200	1Hz	4x547
P2-36	Notch filter 1 attenuation	P S T	0~100	0	1Db	4x548
P2-37	Notch Filter 2 Frequency	P S T	10~1000	200	1Hz	4x549
P2-38	Notch filter 2 attenuation	P S T	0~100	0	1Db	4x550
P2-39	<ul style="list-style-type: none"> Incremental encoder (2500 lines) Hall type selection (※) 0: 4 pairs of motors 1: 5 pair motor Absolute encoder single-turn, multi-turn selection 0: Single-turn position data 1: Multi-turn position data 	P S T	0~6	0	/	4x551
P2-40	Motor zero point signal offset	P S T	0~360	21	Every	4x552

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					time	
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P2-41	Number of motor pole pairs	P S T	1~20	4		4x553
P2-42	No. 23 alarm mask 0: no shielding 1: Shield No. 23 alarm					4x554
P2-43	Internal position control mode selection 0: 8 segment incremental position 1: 8 segment absolute position 2: Arbitrary absolute position	P	0~2	0	/	4x555
P2-44	reserve					4x556
P2-45	DI1 input filter time	P S T	0~10000	10	0.1ms	4x557
P2-46	DI2 input filter time	P S T	0~10000	10		4x558
P2-47	DI3 input filter time	P S T	0~10000	10	0.1ms	4x559
P2-48	DI4 input filter time	P S T	0~10000	10	0.1ms	4x560
P2-49	DI5 input filter time	P S T	0~10000	10	0.1ms	4x561
P2-50	CCW/CW drive inhibit function switch	P S T	0~1	0	/	4x562
P2-51	IPM module alarm level selection	P S T	0~1	0	/	4x563
P2-52	Speed output limiter 1	P S T	100~200 0	1000	0.001	4x564
P2-53	Speed output limiter 2	P S T	100~200 0	1000	0.001	4x565
P2-54	Current output limit	P S T	100~130 0	950	0.001	4x566
P2-55	reference voltage	P S T	1000~ 3000	1700	0.1V	4x567
P2-56	Absolute encoder feedback output Z pulse the width of	P S T	0~32767	30	Pulse	4x568
P2-57	Absolute encoder position read command 1: read single-turn data 2: Read multi-turn data 3: Single-turn reset (used by manufacturers)	P S T	1~5	2	/	4x569

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	4: Multi-turn reset 5: Error Clear					
P2-58	When the absolute encoder feedback is output in advance Pulse amount	P S T	0~32767	20	Pulse	4x570
P2-59	DI6 input filter time	P S T	0~10000	10	0.1ms	4x571
P2-60	DI7 input filter time	P S T	0~10000	10	0.1ms	4x572
P2-61	DI8 input filter time	P S T	0~10000	10	0.1ms	4x573
P2-62	DI9 input filter time	P S T	0~10000	10	0.1ms	4x574

4.3.4 Communication parameters

parameter	name	Applicable method	parameter range around	Defaults	unit	mailing address
P3-00	Station number setting	P S T	1~127	1		4x768
P3-01	Communication transmission rate 0:4800 1:9600 2:19200 3:38400 4:57600 5:1M 6:2M 7:2.5M	P S T	0~7	3	/	4x769
P3-02	Protocol 0: no parity 1+8+N+1; 1: send verification 1+8+O+1; 2: Even parity 1+8+E+1; 3: No parity 1+8+N+2; 4: send verification 1+8+O+2; 5: Even parity 1+8+E+2;	P S T	0~5	0	/	4x770

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P3-03	Communication Error Handling 0: alarm and stop immediately 1: alarm and decelerate to stop 2: keep running	P S T	0~2	0	/	4x771
P3-04	Communication timeout setting	P S T	0~200	0	0.1s	4x772
P3-05	Communication method selection 0: RS-232 (MODBUS RTU) 1: RS-485 (MODBUS RTU) 2: RS-232 (free broadcast protocol) 3: RS-485 (free broadcast protocol) 4: CAN (CANOPEN protocol)	P S T	0~4	0	/	4x773
P3-06	Servo communication reply delay time	P S T	0~1000	20	0.1s	4x774

4.3.5 Extended parameters

parameter	Function code description	Applicable method	Predetermined area	Factory default	unit	mailing address (decimal)
P4-00	Servo motor inching (JOG) control	JOG	0~6000	0	rpm	4x1024
P4-01	given speed in test mode	OL	-6000~6000	100	rpm	4x1025
P4-02	Speed test run start speed	Sr	-6000~6000	0	rpm	4x1026
P4-03	Open loop operating voltage	ON	0~31000	1395	0.01V	4x1027
P4-04	Open loop running speed	ON	0~3000	18	rpm	4x1028
P4-05	Internal position automatic operation and external input selection	Pr	0~1	0	/	4x1029
P4-06	Internal Torque Speed Limit 1	T	-6000~6000	300	rpm	4x1030
P4-07	Internal Torque Speed Limit 2	T	-6000~6000	600	rpm	4x1031
parameter	Function code description	Applicable method	Predetermined area	Factory default	unit	mailing address

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						(decimal)
P4-08	Internal torque speed limit 3	T	-6000~ 6000	1000	rpm	4x1032
P4-09	Internal torque command 1/internal torque limit 1	T	0~500	15	%	4x1033
P4-10	Internal torque command 2/internal torque limit 2	T	0~500	20	%	4x1034
P4-11	Internal torque command 3/internal torque limit 3	T	0~500	20	%	4x1035
P4-12	Position revolution setting of internal position command 1	Pr	0~32767	20	×10000	4x1036
P4-13	Position pulse setting of internal position command 1	Pr	0~32767	0	pulse	4x1037
P4-14	Speed setting for internal position control 1	Pr	-4000~ 4000	100	rpm	4x1038
P4-15	Position revolution setting of internal position reference 2	Pr	0~32767	40	×10000	4x1039
P4-16	Position pulse setting of internal position command 2	Pr	0~32767	0	pulse	4x1040
P4-17	Speed setting for internal position control 2	Pr	-4000~ 4000	200	rpm	4x1041
P4-18	Position revolution setting of internal position command 3	Pr	0~32767	50	×10000	4x1042
P4-19	Position pulse setting of internal position command 3	Pr	0~32767	0	pulse	4x1043
P4-20	Speed setting for internal position control 3	Pr	-4000~ 4000	300	rpm	4x1044
P4-21	Position revolution setting of internal position command 4	Pr	0~32767	20	×10000	4x1045
P4-22	Position pulse setting of internal position command 4	Pr	0~32767	0	pulse	4x1046
P4-23	Speed setting for internal position control 4	Pr	-4000~ 4000	500	rpm	4x1047
P4-24	Position revolution setting of internal position command 5	Pr	0~32767	20	×10000	4x1048
P4-25	Position pulse setting of internal position command 5	Pr	0~32767	0	pulse	4x1049
P4-26	Speed setting for internal position control 5	Pr	-4000~ 4000	-500	rpm	4x1050
P4-27	Position revolution setting of internal position command 6	Pr	0~32767	50	×10000	4x1051
P4-28	Position pulse setting of internal position command 6	Pr	0~32767	0	pulse	4x1052

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P4-29	Speed setting for internal position control 6	Pr	-4000~	-300	rpm	4x1053
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			4000			
parameter	Function code description	Applicable method	Predetermined area	Factory default	unit	mailing address (decimal)
P4-30	Position revolution setting of internal position command 7	Pr	0~32767	40	×10000	4x1054
P4-31	Position pulse setting of internal position command 7	Pr	0~32767	0	pulse	4x1055
P4-32	Speed setting for internal position control 7	Pr	-4000~4000	-200	rpm	4x1056
P4-33	Position revolution setting of internal position command 8	Pr	0~32767	20	×10000	4x1057
P4-34	Position pulse setting of internal position command 8	Pr	0~32767	0	pulse	4x1058
P4-35	Speed setting for internal position control 8	Pr	-4000~4000	-100	rpm	4x1059
P4-36	Auto mode timer 1	Pr	0~10000	0	10ms	4x1060
P4-37	Auto mode timer 2	Pr	0~10000	0	10ms	4x1061
P4-38	Auto mode timer 3	Pr	0~10000	0	10ms	4x1062
P4-39	Auto mode timer 4	Pr	0~10000	0	10ms	4x1063
P4-40	Auto mode timer 5	Pr	0~10000	0	10ms	4x1064
P4-41	Auto mode timer 6	Pr	0~10000	0	10ms	4x1065
P4-42	Auto mode timer 7	Pr	0~10000	0	10ms	4x1066
P4-43	Auto mode timer 8	Pr	0~10000	10	10ms	4x1067
P4-44	Internal speed control reference 1	S	-6000~6000	100	rpm	4x1068
P4-45	Internal speed control reference 2	S	-6000~6000	200	rpm	4x1069
P4-46	Internal speed control reference 3	S	-6000~6000	300	rpm	4x1070
P4-47	Internal speed control reference 4	S	-6000~6000	0	rpm	4x1071
P4-48	Internal speed control reference 5	S	-6000~6000	-300	rpm	4x1072
P4-49	Internal speed control reference 6	S	-6000~	-200	rpm	4x1073

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			6000			
P4-50	Internal speed control reference 7	S	-6000~6000	-100	rpm	4x1074
P4-51	Main circuit undervoltage alarm delay time	P S T	0~10000	20	0.1s	4x1075
P4-52	Overcurrent alarm delay time	P S T	0~200	1	0.05s	4x1076

4.4 I/Odigital input (FROM) Function code planning table

set value	name	Function Description	Function code description	trigger method	run mode
1	SON	servo on	OFF- Servo motor enable and disable ON-servo motor power-on enable	level trigger	P S T
2	ALRS	Alarm reset signal	Faults can be divided into reset faults and non-resettable faults. This function is used to clear the alarm or reset the system after troubleshooting	edge trigger	P S T
3	SHOLD	Internal speed command pause	When the internal speed is running, the servo motor decelerates and stops when this signal is valid	level trigger	S
set value	name	Function Description	Function code description	trigger method	run mode
4	P-OT	Forward drive prohibited	When the mechanical movement exceeds the movable range, it enters the overtravel prevention function ON-forbid forward drive	level trigger	P S T

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			OFF - Allows forward drive		
5	N-OT	Backdrive prohibited	When the mechanical movement exceeds the movable range, it enters the overtravel prevention function ON-prohibits reverse drive; OFF-allows reverse drive	level trigger	P S T
6	RIL	Positive External Torque Limit	①When RIL=ON and FIL=OFF, positive external torque limit	level trigger	P S T
7	IN	Reverse External Torque Limit	②When RIL=OFF and FIL=ON, reverse external torque limit ③In other cases, both forward and reverse directions are limited by external torque	level trigger	P S T
8	PCLR	Clear pulse error	ON-Clear the stagnant pulse of the servo drive, and the servo will stop immediately OFF- Servo stops automatically after the command pulse stays in operation	Edge/level trigger	P
9	LOK	zero speed clamp	ON-zero-speed clamping, does not receive any speed analog voltage, and the motor is in a zero-speed state; OFF-receives external analog voltage, and the speed runs according to the given voltage command	level trigger	S T
10	SPD1	Internal speed selection 1	For speed multi-stage switching function	level trigger	S T
11	SPD2	Internal speed selection 2			
12	SPD3	Internal Speed Selection 3			
set value	name	Function Description	Function code description	trigger method	run mode
13	MDC	Control mode switching	for blend mode switching	level trigger	P S T

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14	INH	Position command prohibited	ON - allow external command pulse input OFF-Prohibit external pulse command input					level trigger	Pt
15	SPDINV	Inversion of speed command direction	ON-command reverse direction OFF - default command direction					level trigger	S T
16	G-SEL	Speed gain switching	ON-Speed gain cut, see P2-09 for switching coefficient OFF-system default control					level trigger	P S T
17	GN1	Electronic gear ratio numerator selection 1						level trigger	P
			GN1	GN2	GN3	GN4	molecular		
18	GN2	Electronic gear ratio numerator selection 2	0	0	0	0	P1-06		
35	GN3	Electronic gear ratio numerator selection 3	0	1	0	0	P1-07	level trigger	
			0	0	1	0	P1-08		
36	GN4	Electronic gear ratio numerator selection 4	0	0	0	1	P1-09		
19	PTRG	internal position trigger	Multiple location triggers					edge trigger	Pr
20	PHOLD	internal position pause	When the internal position is running, ON-pause, OFF-continue to run					level trigger	Pr
21	TEN	start back to square one	Trigger the servo to return to the origin					edge trigger	P S T
set value	name	Function Description	Function code description					trigger method	run mode

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22	ORG1	Proximity switch signal 1	When the servo returns to the origin, when ORG1 is valid, the servo starts to decelerate or stop	Edge/level trigger	P S T
23	ORG1	Proximity switch signal 2	When the servo returns to the origin, when ORG1 is valid, the servo starts to decelerate or stop	Edge/level trigger	P S T
24	POS1	Internal speed selection 1	It is used for position multi-segment switching function. Currently, DSL200 can only select 8-segment positions. If more positions are needed, the manufacturer can customize	level trigger	Pr
25	POS2	Internal speed selection 2			
26	POS3	Internal Speed Selection 3			
27	POS4	Internal Speed Selection 3			
28	TTRINV	Torque command reverse	ON-Reverse direction of command; OFF-Default direction of command	level trigger	T
31	EMC	emergency stop	ON-emergency stop OFF - continue to run	level trigger	P S T
33	JOG+	forward jog	ON - Enter according to the given command OFF-Run command stop input	level trigger	S
34	JOG-	negative jog	ON - Enter according to the given command OFF-Run command stop input	level trigger	S
37	MPD0	internal position control manual /auto switch	ON-manual operation OFF-automatic operation	level trigger	Pr

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set value	name	Function Description	Function code description			trigger method	run mode
38	MD0	Internal Position Control Manual Speed Selection 1				level trigger	Pr
			MD0	MD1	speed		
39	MD1	Internal Position Control Manual Speed Selection 2	0	1	P4-45	level trigger	Pr
			1	0	P4-44		
			0	0	0		
			1	1	1		
40	SetAxis	Coordinate origin setting	Set the origin position of the servo motor (for DSL200-P4 series only)			edge trigger	P S T

4.5 I/O digital output (DO) Function code planning table

set value	name	function name	describe	operating mode
1	HEART S	servo ready	Signal output after servo initialization is completed	P S T
2	ALRM	Servo alarm	Signal output when servo fails	P S T
3	ZSPD	location reached	The output signal when the number of retained pulses is less than or equal to the value set by P1-36	P
4	TSPD	Torque reached	The output signal when the motor torque output reaches the set torque value	T
	SSPD	Speed up	The output signal when the electromechanical speed reaches the value set by P1-37	S

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	HOME	Servo return to zero completed	The output signal when the servo motor returns to zero	P S T
5	BRKR	brake signal output	Brake signal output, valid - close, release the brake; invalid - start the brake	P S T

4.6 Servo zero return method definition table

The DSL200-P1 series and DSL200-P5 can complete various zero return functions by themselves, and automatically output a completion signal to the host computer after the zero return is completed. The zero return of the DSL200 series has the following characteristics:

- ①The zero return is simple and convenient, and the repeat zero return accuracy is high, without the intervention of the upper computer, which simplifies the zero return operation of the upper computer
- ②The zero return operation must be performed after the servo is enabled
- ③The zero return operation has the highest priority. As long as the zero return condition is met, the servo motor will immediately perform the zero return operation. After power-on, it can perform multiple zero return operations
- ④ After P1-28 is set to 1, the servo can automatically execute the zero return operation after power-on, and automatically enter the control mode set by P1-00 after the zero return is completed
- ⑤ The fixed width of the zero return completion signal is 100ms

Since incremental encoders are slightly different from absolute encoders in returning to zero, they are introduced separately below:

4.6.1 DPX200-P1 series(2500 linear incremental encoder)

P1-29	Definition of return to zero	Description of the process of returning to zero
		①When P1-28 is set to 1 or the I/O input pin is planned as SHOME and is valid, the servo motor first returns to zero at the speed set by P1-30 (high speed)

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0/1/2/3	DOG detection + Z pulse	<p>②When the I/O input pin is planned as ORG1 and it is valid, the servo starts to search for Z pulse at the speed set by P1-31 (low speed)</p> <p>③When the Z pulse appears, the servo motor stops running, and the zero return is completed</p> <p>④Output zero return complete signal, automatically enter the control mode set by P1-00</p>
P1-29	Definition of return to zero	Description of the process of returning to zero
4	Double DOG detection + Z pulse	<p>①When P1-28 is set to 1 or the I/O input pin is planned as SHOME and is valid, the servo motor first returns to zero at the speed set by P1-30 (high speed)</p> <p>② There will be two situations as follows:</p> <ul style="list-style-type: none"> When the I/O input pin is planned as ORG1 and it is valid first, the servo starts to search for the Z pulse at the speed set by P1-31 (low speed). Return to zero complete signal, automatically enter the control mode set by P1-00 When the I/O input pin is planned as ORG2 and it is valid first, the servo starts to reversely search for the ORG1 signal at P1-30 (high speed); if the ORG1 signal is valid, the servo starts to search at the speed set at P1-31 (low speed) Z pulse, after the Z pulse is detected, the servo motor stops, the zero return is completed, and the zero return completion signal is output at the same time, and it automatically enters the control mode set by P1-00
6	Z pulse + offset	<p>①When P1-28 is set to 1 or the I/O input pin is planned as SHOME and is valid, the servo motor first searches for the Z pulse signal at the speed set by P1-31</p> <p>②When the Z pulse is detected, the servo motor will move for an offset pulse at the set value of P2-19 (third zero return speed) ($P1-32 \times 10000 + P1-33$)</p> <p>③ After the offset pulse amount is completed, the motor stops and the zero return is completed, and at the same time the zero return completion signal is output, and it automatically enters the control mode set by P1-00</p>
		<p>①When P1-28 is set to 1 or the I/O input pin is planned as SHOME and is valid, the servo motor first returns to zero at the speed set by P1-30 (high speed)</p>

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8/9	DOG detection + Z pulse + offset	<p>②When the I/O input pin is planned as ORG1 and it is valid, the servo starts to search for Z pulse at the speed set by P1-31 (low speed)</p> <p>③When the Z pulse is detected, the servo motor will move for an offset pulse at the set value of P2-19 (third zero return speed) ($P1-32 \times 10000 + P1-33$)</p> <p>④ After the offset pulse amount is completed, the motor stops, the zero return is completed, and the zero return completion signal is output at the same time, and the control mode set by P1-00 is automatically entered</p>
P1-29	Definition of return to zero	Description of the process of returning to zero
10	DOG detection (trigger level)	<p>①When P1-28 is set to 1 or the I/O input pin is planned as SHOME and is valid, the servo motor first returns to zero at the speed set by P1-30 (high speed)</p> <p>②When the I/O input pin is planned as ORG1 and is valid, the motor stops, the zero return is completed, and the zero return completion signal is output at the same time, and it automatically enters the control mode set by P1-00</p>
11	DOG detection (rising edge)	<p>①When P1-28 is set to 1 or the I/O input pin is planned as SHOME and is valid, the servo motor first returns to zero at the speed set by P1-30 (high speed)</p> <p>②When the I/O input pin is planned as ORG1 and turns OFF->ON, the motor stops, the zero return is completed, and the zero return completion signal is output at the same time, and it automatically enters the control mode set by P1-00</p>
12	DOG detection + torque	<p>①When P1-28 is set to 1 or the I/O input pin is planned as SHOME and is valid, the servo motor first returns to zero at the speed set by P1-30 (high speed)</p> <p>②When the torque output by the servo motor is greater than or equal to the value set by P4-09, the servo starts to search for the Z pulse at the speed set by P1-31 (low speed).</p> <p>③After the Z pulse is detected, the servo motor stops running, and the zero return is completed</p> <p>④Output zero return completion signal, and automatically enter the control mode set by P1-00</p>

第五章 通电运行

5.1 power connection

(1) Connect the power supply to the main circuit power input terminal through the electromagnetic contactor (three-phase connection to L1, L2, L3, single-phase connection to L1, L2).

(2) The power supply R and S of the control circuit are connected with the main circuit power supply at the same time or before the main circuit power supply. If only the control circuit power supply is turned on, the servo ready signal (SRDY) is OFF.

(3) After the main circuit power is turned on, there is a delay of about 1.5 seconds, and the servo ready signal (SRDY) is ON. At this time, the servo enable (SON) signal can be accepted. After detecting that the servo enable is valid, the drive output is valid, and the motor is excited. Operating status. When it is detected that the servo enable is invalid or there is an alarm, the base circuit is closed and the motor is in a free state.

(4) When the servo enable is switched on together with the power supply, the base circuit is switched on approximately 1.5 seconds later.

(5) Frequent switching on and off of the power supply may damage the soft start circuit and dynamic braking circuit. The frequency of switching on and off should be limited to 5 times per hour and less than 30 times per day. If the drive unit or motor is overheated, the

After rectifying the cause of the fault, wait for 30 minutes to cool down before turning on the power again.

◎Whether the wiring of the power supply terminal is correct, and whether the reliable input voltage is correct?

◎Whether the power line and motor line are short-circuited or grounded?

◎Is the encoder cable connected correctly?

◎Is the control signal terminal connected correctly?

◎Are the polarity and size of the power supply correct?





◎Are the drive unit and motor fixed firmly?

◎Is the motor shaft not connected to the load?

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5.2 speed test run

5.2.1 Operating procedures

- (1) Set parameter P1-00 = 11 to make the servo work in speed test run mode.
- (2) Set parameter P1-04 = 1, the servo is enabled.
- (3) Enter parameter P4-02, use  、  key to change the speed command.
- (4) The motor runs at a given speed.  The control speed increases positively,  The control speed decreases in the forward direction (increases in the reverse direction). When the displayed speed is a positive value, the motor rotates forward; when the displayed speed is a negative value, the motor rotates reversely.



5.2.2 parameter settings

required parameter	name	unit	parameter range	Factory default
P1-00	control mode	/	0-31	0
P1-04	Servo internal enable	/	0	0
P4-02	Speed test run internal speed command given	Rpm	0	0


5.3 JOGrun

5.3.1 Operating procedures



The numerical unit of JOG operation is r/min, and the JOG operation mode can be performed according to the following setting method

- (1) Set parameter P1-00 = 12 to make the servo work in JOG mode.
- (2) Set parameter P1-04 = 1, the servo is internally enabled.
- (3) Enter the parameter P4-00, modify the parameter value to give the speed command.
- (4) press  、  key to modify the inching speed value, for example, P4-00=100 means 100r/min.

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- (5) After modification, press the  key to confirm

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- (6) press  、  Press the key to make the servo motor rotate in the positive direction or reverse direction, and release the key to stop the servo motor immediately.


Note: During speed test run, JOG run or test run, if the motor has abnormal conditions such as vibration and noise, it is necessary to debug parameters such as P2-00, P2-01, and P2-16. For specific debugging methods, refer to Chapter 4. The parameters are explained in detail.

5.3.2 parameter settings

required parameters	name	unit	parameter range	Factory default
P1-00	control mode	/	0-31	0
P1-04	Servo internal enable	/	0	0
P4-00	JOG running internal speed command given	Rpm	0	0

5.4 test run

5.4.1 Operating procedures

- (1) Set parameter P1-00 = 13 to make the servo work in test run mode.
- (2) Set parameter P1-04 = 1, the servo is internally enabled.
- (3) Enter the parameter P4-01, modify the parameter value to give the speed command.
- (4) After modification, press  Press the key to confirm, and the servo will run according to the value set by P4-01. A positive value means forward transmission, and a negative value means reverse rotation.

5.4.2 parameter settings

required parameters	name	unit	parameter range	Factory default
---------------------	------	------	-----------------	-----------------

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P1-00	control mode	/	0-31	0
P1-04	Servo internal enable	/	0	0
P4-02	Test run internal speed command given	Rpm	0	0

5.5 position control

5.5.1 Operating procedures

- (1) Connect CN2 to make the input control signal (SON) OFF
- (2) Turn on the power supply of the control circuit (the main circuit power supply is not connected temporarily), the display of the drive unit is on, and if there is no alarm, it will display "r - 0". If there is an alarm, please find out the cause of the alarm until there is no alarm.
- (3) Set the control mode selection parameter P1-00 to 0, and set an appropriate electronic gear ratio (P1-06~P1-10).
- (4) Select the external position command pulse input form, such as pulse + direction, then P1-02 = 0.
- (5) Turn on the main circuit power supply.
- (6) After confirming that there are no abnormalities and alarms, make the input control signal (SON) in the ON state, and the motor will be excited at zero speed.
- (7) The operating position pulse signal is output to CN2_24, CN225, CN212, CN2_13 pins to make the motor run according to the command.
- (8) If the motor rotation direction is inconsistent with the actual required direction, set P1-01 to 1 (reverse direction).
- (9) In the monitoring state, Fn-01 and Fn-02 can display the current pulse value fed back by the encoder; Fn-03 and Fn-04 can display the position command pulse input value of the host computer.

5.5.2 parameter settings

required parameters	name	unit	parameter range	Factory default
P1-00	control mode	/	0-31	0
P1-01	command direction	/	0-3	0
P1-02	Test run internal speed command given	Rpm	0-6000	0

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P1-04	Servo internal enable	/	0-1	0
P1-06	Electronic gear ratio numerator (N1)	/	1-32767	1
P1-10	Electronic gear ratio denominator (M)	/	1-32767	1
P2-00	Speed Control Proportional Gain	0.1	5-1280	155
P2-01	Velocity integral time constant 1	0.1ms	1-32767	130
P2-02	Position Control Proportional Gain	0.1	0-2000	280
P2-16	Speed detection low-pass filter coefficients	/	10-10000	100
P2-23	Position command smoothing function selection switch	/	0-1	0
P2-24	Position command smoothing filter coefficient	%	1-10000	200

5.6 speed control 1(External analog command voltage input)

5.6.1 Operating procedures

- (1) Connect CN2 to make the input control signal (SON) OFF
- (2) Turn on the power supply of the control circuit (the main circuit power supply is not connected temporarily), the display of the drive unit is on, and if there is no alarm, it will display "r - 0". If there is an alarm, please find out the cause of the alarm until there is no alarm.
- (3) Set control mode selection parameter P1-00 to 2
- (5) Turn on the main circuit power supply.
- (6) Adjust the output of the analog speed potentiometer (V-REF) to the minimum. After confirming that there is no abnormality or alarm, make the input control signal (SON) in the ON state. At this time, the motor is excited. Due to the existence of voltage zero drift, the motor may be Turn at a very small speed.
- (7) The analog speed command voltage is zero-adjusted, the specific method is as follows:

• Manual zeroing

- ① Switch the menu display to "Fn-08" (speed monitoring status) in monitoring mode.
- ② Observe the currently displayed speed. If it is forward rotation, enter the

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parameter mode and adjust the value of P1-18 to a larger direction; "r - 0".

- **auto zero**

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① Switch the menu display to "Fn-08" (speed monitoring status) in monitoring mode.

② Set parameter P1-17 to 1 to realize automatic zero drift adjustment. After adjustment, P1-17 will automatically return to 0.

(8) Actual speed command = (input voltage value / 10.0V) × (P1-13)

5.6.2 parameter settings

Necessary	name	unit	parameter range	Factory default
P1-00	control mode	/	0-31	0
P1-01	command direction	/	0-3	0
P1-13	Analog command maximum swing speed	Rpm	-6000-6000	3000
P1-17	Analog speed command voltage hardware zero drift automatic adjustment	/	0-1	
P1-18	Analog speed command voltage hardware zero drift manual adjustment	/	-4096-4096	0
P1-20	Analog Speed Input Proportional Gain	0.001	20-3000	1000
P1-21	Analog speed command voltage forward gain	0.001	20-3000	1000
P1-22	Analog speed command voltage negative gain	0.001	20-3000	1000
P2-00	Speed Control Proportional Gain	0.1	5-1280	155
P2-01	Velocity integral time constant 1	0.1ms	1-32767	130
P2-16	Speed detection low-pass filter coefficients	/	10-10000	100
P2-26	speed control acceleration	ms	0~10000	300
P2-27	speed control deceleration	ms	0~10000	300

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5.7 speed control 2(Internal register speed given)

5.7.1 Operating procedures

- (1) Connect CN2 to make the input control signal (SON) OFF
- (2) Turn on the power supply of the control circuit (the main circuit power supply is not connected temporarily), the display of the drive unit is on, and if there is no alarm, it will display "r - 0". If there is an alarm, please find out the cause of the alarm until there is no alarm.
- (3) Set control mode selection parameter P1-00 to 5
- (5) Turn on the main circuit power supply.
- (6) Set the internal speed given parameter value P4-44.
- (7) After confirming that there is no abnormality or alarm, make the input control signal (SON) ON, and the motor will run at the speed set by P4-44.

5.7.2 parameter settings

Necessary	name	unit	parameter range	Factory default
P1-00	control mode	/	0-31	0
P1-01	command direction	/	0-3	0
P2-00	Speed Control Proportional Gain	0.1	5-1280	155
P2-01	Velocity integral time constant 1	0.1ms	1-32767	130
P2-16	Speed detection low-pass filter coefficients	%	10-10000	100
P4-44	Internal speed control given	Rpm	-6000-600	100
P2-26	speed control acceleration	ms	0~10000	300
P2-27	speed control deceleration	ms	0~10000	300

and processing

注意

- 参与检修人员必须具有相应专业知识和能力。
- 伺服驱动单元和电机断电至少5分钟后，才能触摸驱动器和电机，以免电击和灼伤。
- 驱动单元故障报警后，须根据报警代码排除故障后才能投入使用。
- 复位报警前，必须确认SON（伺服有效）信号无效，防止电机突然起动引起

6.1 Alarm list

alarm indicatio n	Alarm name	Inside Allow
--	normal	
BUT 01	Overspeed alarm	Servo motor speed exceeds the set value
BUT 02	Main circuit overvoltage alarm	Main circuit power supply voltage is too high
BUT 03	Main circuit undervoltage alarm	Main circuit power supply voltage is too low
BUT 04	Position out-of-tolerance alarm	The value of the position deviation counter exceeds the set value
BUT 05	Encoder overheat alarm	Encoder temperature is too high
BUT 06	Speed Amplifier Saturation Fault	Speed regulator saturates for a long time
BUT 07	Drive disabled exception	Both CCW and CW drive prohibition inputs are OFF
BUT 08	Encoder power failure alarm	Multi-turn absolute encoder battery voltage is too low
BUT 09	Encoder feedback signal error	Encoder feedback data or signal is wrong
BUT 10	Control power undervoltage	Control power is low

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BUT 11	IPM module failure	IPM intelligent module failure
BUT 12	Overcurrent	Motor current is too high
BUT 13	overload	Servo drive and motor overload (instantaneous overheating)
BUT 14	brake failure	Brake circuit failure
BUT 15	Motor pole pair number error alarm	The number of pole pairs of the motor does not match the corresponding motor
BUT 16	Main circuit power failure alarm	The main circuit is not powered on
BUT 17	reserve	reserve
BUT 18	Invalid motor model	The motor model is not written into the incremental encoder
BUT 19	Encoder disconnection alarm	The encoder cable is not connected or disconnected
BUT 20	EEPROM error	EEPROM error
BUT 21	Serial communication error alarm	RS232 or RS485 communication error
BUT 22	Current sampling loop alarm	Current sampling power input is incorrect
BUT the 23rd	Motor power line phase sequence error alarm	The UVW of the motor is wrongly connected or the wire is disconnected and the phase is lost
BUT 25	Z signal loss alarm	The drive does not detect the encoder Z signal
BUT the 26th	CPLD data bus error	DSP and CPLD data transmission error
BUT the 27th	Module temperature alarm	Module temperature overheating alarm
BUT 32	overload alarm	The continuous output of the motor exceeds the rated load

6.2 Alarm handling method

Call the police the code	Call the police name	run state	reason	Approach
ALE01	speeding	Turn on the control power appears when the	①The control circuit board is faulty. ②Encoder failure	① Replace the servo driver. ② Replace the servo motor.

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		source		
		Appears during motor operation	Input command pulse frequency is too high.	Correctly set the input command pulse.
			Acceleration/deceleration time constant is too small to make Speed overshoot is too large.	Increase the acceleration/deceleration time constant.

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			The input electronic gear ratio is too large.	set correctly.
			Encoder failure.	Replace the servo motor.
			Defective encoder cable.	Replace the encoder cable.
			The servo system is unstable, causing overshoot.	①Reset related gain. ② If the gain cannot be set to an appropriate value, then reduce the load moment of inertia ratio.
		Appears when the motor is just started	The load inertia is too large.	①Reduce the load inertia. ② Replace the drive and motor with higher power.
			Encoder zero point error.	① Replace the servo motor ②Please ask the manufacturer to reset the zero point of the encoder.
			①The U, V, W leads of the motor are connected incorrectly. ②The lead wires of the encoder cable are wrongly connected.	Wire it correctly.
ALE02	Main circuit overvoltage	Turn on the control power appears when the source	Circuit board failure.	Replace the servo drive unit.
		Turn on the main power appears when	①The power supply voltage is too high. ②The waveform of the power supply voltage is abnormal.	Check the power supply.
		Appears during motor operation	The braking resistor wiring is disconnected.	Rewire.
			①The braking transistor is damaged. ②The internal braking resistor is damaged.	Replace the servo drive unit.

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			Brake circuit capacity is not enough.	<ul style="list-style-type: none">①Reduce the start-stop frequency.② Increase the acceleration/deceleration time constant.③Reduce the torque limit value.④Reduce the load inertia.⑤ Replace the drive and motor with higher power.
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ALE03	Main circuit under voltage	Appears when the main power is turned on	①The circuit board is faulty. ②The fuse of the power supply is damaged. ③The soft start circuit is faulty. ④ The rectifier is damaged.	Replace the servo drive unit.
			①The power supply voltage is low. ②Temporary power failure over 20mS.	Check the power supply.
			Power on frequently	The power-on interval time is more than 3 seconds
		Appears during motor operation	①The power capacity is not enough. ② Instantaneous power failure. ③ IPM module short circuit	Check the power supply and IPM module
			The radiator is overheating.	Check load conditions.
ALE04	Location out of tolerance	Turn on the control power appears when the source	Circuit board failure.	Replace the servo drive.
		Connect the main power supply and control line, input command pulse, the motor does not rotate	①The U, V, W leads of the motor are connected incorrectly. ②The lead wires of the encoder cable are wrongly connected.	Wire it correctly.
			Encoder failure.	Replace the servo motor.
			The set position out-of-tolerance detection range is too large	Increase the position out-of-tolerance detection range.
			Small.	
			The position proportional gain is too small.	Increase gain.
			Insufficient torque.	① Check the torque limit value. ②Reduce the load capacity. ③ Replace the drive unit and motor with higher power.
			Command pulse frequency is too high.	Reduce the frequency.

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ALE05	Encoder overheating	Appears when the control power is turned on	Circuit board failure.	Replace the servo drive unit.
			①The cable is disconnected. ②The internal temperature relay of the motor is damaged.	① Check the cable. ② Check the motor.

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		Appears during motor operation	Motor overload causes overall heating	①Reduce the load. ②Reduce the start-stop frequency. ③Reduce the torque limit value. ④Reduce related gains. ⑤ Replace the drive unit and motor with higher power.
			Encoder internal fault.	① Replace the servo motor.
ALE06	Speed Amplifier Saturation Fault	Appears during motor operation	The motor is mechanically stuck.	Check the load mechanism.
			The load is too large.	①Reduce the load. ② Replace the drive unit and motor with higher power.
ALE07	Drive forbidden stop exception		CCW, CW drive inhibit input terminals are disconnected.	Check wiring, power consumption of input terminals source.
ALE08	Encoder off Telegram police		①The motor encoder is damaged. ②The battery has no power. ③The encoder cable is defective.	①Replace the battery. ② Check whether the encoder cable is damaged. ③Replace the drive unit.
ALE09	Encoder feedback signal error		Encoder wiring error.	Check wiring.
			Encoder damaged.	Replace the motor.
			Defective encoder cable.	Change the cable.
ALE09	Encoder communication error		The encoder cable is too long, causing the encoder supply voltage to be low.	① Shorten the cable. ② Use multi-core parallel power supply.
BUT 10	Control power supply undervoltage		The input control power is low.	Check control power.
			① The internal connector of the driver is defective. ②The switching power supply is abnormal. ③The chip is damaged.	① Replace the drive unit. ② Check the connector. ③ Check the switching power supply.

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BUT 11	IPM module block fault	Appears when the control power is turned on	Circuit board failure.	Replace the servo drive unit.
		Appears during motor operation	①The power supply voltage is low. ② overheating.	① Check the drive unit. ② Power on again. ③Replace the drive unit.
			Drive short circuit among U, V, W.	Check wiring.
			Poor grounding.	Properly grounded.
			Damaged motor insulation.	Replace the motor.
			disturbed.	① Increase the line filter. ②Keep away from sources of interference
BUT 12	Overcurrent		Short circuit among drivers U, V, W.	Check wiring.
			Poor grounding.	Properly grounded.
			Damaged motor insulation.	Replace the motor.
			The drive is damaged.	Replace the drive unit.
ALE13	overload	Appears when the control power is turned on	Circuit board failure.	Replace the servo driver.
		Appears during motor operation	Running above the rated torque.	① Check the load. ②Reduce the start-stop frequency. 1 Reduce the torque limit value. 2 Replace drive unit and motor with higher power
			The holding brake is not open.	Check holding brake.
			The motor oscillates erratically.	① High integral gain. ②Increase the acceleration/deceleration time. ③Reduce the load inertia.
			① One phase of U, V, W is disconnected. ②The wiring of the encoder is wrong.	Check wiring.

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BUT 14	Brake failure	Appears when the control power is turned on	Circuit board failure.	Replace the servo drive unit.
		Appears during motor operation	The braking resistor wiring is disconnected.	Rewire.
			①The braking transistor is damaged. ②The internal braking resistor is damaged.	Replace the servo drive unit.
BUT 14	Brake failure	Appears during motor operation	Brake circuit capacity is not enough.	①Reduce the start-stop frequency. ② Increase the acceleration/deceleration time constant. ③Reduce the torque limit value. ④Reduce the load inertia. ⑤ Replace the drive unit and motor with higher power.
			Main circuit power is too high.	Check mains power.
BUT 15	The number of motor pole pairs is wrong error	When the motor is powered on or running Appear	The number of pole pairs of the motor does not match the corresponding motor	Re-modify the correct number of pole pairs of the corresponding motor, and then re-Power-on
BUT 16	Main circuit cut off alarm		The main circuit is not powered on	Check mains power
			Main circuit overvoltage	Check mains power
			Main circuit undervoltage	Check mains power.
BUT 18	Invalid motor model		The motor model is not written into the EEPROM of the incremental encoder	Incremental encoding of the motor at the factory The controller does not write the motor model or writes the motor model as 0
BUT 19	Encoder disconnection		Encoder cable not connected or damaged	Connect the encoder cable; replace the encoder cable

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	alarm police			
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BUT 20	EEPROM error		Chip or board damage	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"> <div style="border: 1px solid black; border-radius: 50%; width: 15px; height: 15px; margin-bottom: 5px;"></div> <div style="border: 1px solid black; border-radius: 50%; width: 15px; height: 15px; margin-bottom: 5px;"></div> </div> <div> 1 Replace the servo drive unit. 2 After repairing, you must reset the driver model (parameter P1-01), and then restore the default parameters </div> </div>
BUT 21	Serial communication error alarm		RS232 or RS485 communication error	① Check whether the communication line is intact ② Is the communication data format correct? exactly
BUT 22	Current sampling loop alarm		The power input of the current sampling circuit is incorrect	① Check whether the input power is within the specified range ② Check whether the link of the amplifier circuit is Is there any abnormal phenomenon
ALE23	Phase sequence error alarm	During driver enable	① The phase sequence of the motor power line is wrong. ②The motor power line is out of phase. ③The motor is abnormal.	①Replace the motor. ②Replace the power line. ③ Check whether the power line wiring is correct.
BUT 25	Z signal Lost alarm	Appears during motor operation	① The internal circuit of the driver is bad. ②The encoder cable is damaged. ③The motor encoder is abnormal.	① Replace the drive. ② Replace the encoder cable. ③/Replace the drive.
BUT the 26th	CPLD data bus error	Occurs during drive power-on	① The communication between the main chips of the drive is abnormal	①Replace the drive
ALE27	Module temperature alarm	Appears during motor operation	① The internal circuit of the driver is bad. ②Module temperature is too high.	①Replace the drive unit ②Reduce the operating load of the motor ③Reduce the motor running speed
ALE32	overload	Turn on the control power source appears	Circuit board failure.	Replace the servo drive.

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		Appears during motor operation	Running above the rated torque.	① Check the load. ② Reduce the start-stop frequency. ③ Reduce the torque limit value. ④ Replace drive unit and motor with higher power
			The holding brake is not open.	Check holding brake.
			The motor oscillates erratically.	① High integral gain. ② Increase the acceleration/deceleration time. ③ Reduce the load inertia.

7.1 scope of application

DSL200-F1 series drivers support MODBUS RTU protocol, can use RS485 communication or CAN communication, and have a "single master and multiple slaves" communication network. Before using the communication function, the communication parameters (station number P3-00, baud rate P3-01, data format P3-02) must be set for each driver. Through the communication function, the upper computer can directly modify the internal parameters of the drive, read the running status of the servo, etc.

7.2 protocol format

MANY



The protocol format is shown in the figure above. The checksum in the ADU is the CRC16 checksum of the front part of the ADU delivered through the high and low bytes. In the protocol format, the low byte of the CRC comes first, and the high byte follows.

1. Read the function code parameter or status word of the servo drive (command code 0x03)

Part of ADU	byte	scope
The host sends a request:		
slave address	1	1-0xFEH
command code	1	0x03H
Register start address	2	0x0000H-0xFFFFH
number of registers	2	0x0000H-0x0008H
CRC check (low byte first)	2	

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The slave responds:		
slave address	1	local address
command code	1	0x03H
read bytes	1	0x02H
Register content	2	Register content
CRC check	2	

For example: the value of read parameter P1-06 is 1

Master sends: 0x01 0x03 0x01 0x06 0x00 0x01 0x65 0xf7 Slave

returns: 0x01 0x03 0x02 0x00 0x01 0x79 0x84

2. Write the single function code or control parameter of the servo drive (command code 0x06)

Part of ADU	byte	scope
The host sends a request:		
slave address	1	1-0xFEH
command code	1	0x06H
Register start address	2	0x0000H-0xFFFFH
data content	2	0x0000H-0x0008H
CRC check (low byte first)	2	
The slave responds:		

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slave address	1	local address
command code	1	0x03H
register address	2	0x0000H-0xFFFFH
Register content	2	Register content
CRC check	2	

For example, write 10 into parameter P1-06

Host sends: 0x06 0x01 0x05 0x00 0x0A 0x36 0xC2
 0x01

Slave returns: 0x06 0x01 0x05 0x00 0x0A 0x69 0xFB
 0x01

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3. Write the single function code or control parameter of the servo drive (command code 0x10)

Part of ADU	byte	scope
The host sends a request:		
slave address	1	1-0xFEH
command code	1	0x10H
Register start address	2	0x0000-0xFFFF
Register Content Bytes	1	0x0000-0x0008
Register content	2*number of registers	
CRC check (low byte first)	2	
The slave responds:		
slave address	1	local address
command code	1	0x10
Register start address	2	0x0000-0xFFFF
Part of ADU	byte	scope
number of registers	2	0x0000-0x0008
CRC check	2	

7.3 CRC check

The sending device first calculates the CRC value and attaches it to the sending message. The receiving device will recalculate the CRC value after receiving it, and compare the calculated value with the received CRC value. If the two values are not equal, it means that there is an error in the sending process.

Calculation process of CRCj check:

- (1) Define a CRC register and assign an initial value, 0xFFFF
- (2) XOR the first byte of the sent information with the value of the CRC register, and put the result in the CRC register. Starting from the address code, the start bit and stop bit do not participate in the calculation.
- (3) Extract and check LSB (lowest bit of CRC register)
- (4) Each bit of the CRC register is shifted one bit to the right, and the highest bit is supplemented with 0.
- (5) If the LSB is 1, XOR the value of the CRC register with A001H, and put the result into the CRC register.
- (6) Repeat steps 3, 4, 5 until 8 shifts are done.
- (7) Repeat steps 2, 3, 4, 5, 6 to process the next byte of the sent message. The above process is repeated continuously until all bytes of the sent information are processed.
- (8) After the calculation is completed, the content of the CRC register is the value of the CRC check
- (9) When sending, send the low byte of the CRC check value first, and then send the high byte